The development of adolescent relationships

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THE DEVELOPMENT OF ADOLESCENT RELATIONSHIPS: A PERSON-CENTERED APPROACH

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Chapter 1

General introduction

One of the most striking phenomena of adolescence are the changes in personal relationships. Adolescence is often depicted as period of waning parental influence as children shift their focus from family relationships to friendships and romantic relationships (Blos, 1967; Sullivan, 1953; Youniss & Smollar, 1985). Although the nature of the parent-adolescent relationship changes, these relationships remain important for adolescents.

Various influential developmental perspectives, such as attachment (Bowlby, 1978) and social cognitive theories (Bandura, 1977), commonly illustrate how the family relationships can affect other personal relationships. Research has provided support for these perspectives by showing continuity between parent-adolescent relationships and friendship (e.g., Baril, Julien, Chartrand, & Dubé, 2009; De Goede, Branje, & Meeus, 2009a) and romantic relationships (Kretschmer, Vollebergh, & Oldehinkel, 2017; Seiffge-Krenke, Overbeek, & Vermulst, 2010).

However, most research fails to constellate the multidimensional nature of adolescents' relationship with parents simultaneously and capture the potential individual differences that can occur in relationship experiences. This is a limitation, as relationship quality can only be understood if combinations of multiple dimensions are considered (e.g., Laursen & Hoff, 2006). Additionally, obviously not all individuals experience similar interpersonal relationship quality. In fact, there is accumulating evidence of individual differences in adolescents' relationship development (e.g., Arnett, 1999; Hollenstein & Lougheed, 2013).

One way to overcome previous limitations is by applying a person-centered approach. Such approaches can take account of the multidimensional nature of parent-adolescent relationships as well as the potential individual differences herein by constellating multiple relational dimensions to produce relational quality profiles (e.g., Laursen, Furman, & Mooney, 2006; Laursen & Hoff, 2006). Until now, little research has used a person-centered approach to examine adolescents' parent-adolescent relationship development and investigate continuity from parent-adolescent relationships into friendships and romantic relationships.

The focus of this thesis is twofold. First, individual differences in adolescent relationship quality development with parents will be examined. For this purpose, a person-centered approach is applied to generate a parent-adolescent relationship typology using multiple relational dimensions. Second, this thesis focuses on individual differences in how adolescent relationship quality with parents continues into their friendship and romantic relationships. This will be examined by applying a person-centered approach to produce a parent-adolescent relationship typology and by exploring the differences

in friendship and romantic relationship quality among the various parent-adolescent relationship types.

Adolescents' Relationships with Parents, Friends, and Romantic Partners

Many developmental changes occur in the relationship with parents, friends, and romantic partners during adolescence. This section describes these issues in three parts. The first part provides a definition of personal relationships and describes similarities and differences among adolescents' relationship with parents, friends, and romantic partners. The second part describes how adolescents' relationship with parents, friends, and romantic partners develop over time. Finally, the third part describes how adolescents' relationship with parents affect the quality of their friendships and romantic relationships.

Parent-adolescent, friend, and romantic relationships characteristics

What are personal relationships exactly? The model of social complexity (Hinde, 1997; Scholte, 1998) offers a conceptual framework to answer this question. According to this model, personal relationships entail a set of interactions between two individuals who know each other and take account of each others' behavior. Interactions between individuals shape the quality of the relationship and the relationship, in turn, shapes the quality of the interactions. For example, supportive interactions between individuals could indicate a supportive relationship and such a high quality relationship may further motivate individuals for being supportive to each other. Individuals can have many different personal relationships at the same time, and these relationships can be influenced by other relationships the individual is engaged in (Scholte, 1998).

Adolescents have a number of personal relationships with different people, such as parents, friends, and romantic partners. According to the exchange theory (Laursen, 1996), adolescents' relationship with parents fundamentally differ from their relationship with friends and romantic partners. This theory defines adolescents' relationship with parents as closed-field or involuntarily relationships. These relationships are not easily disrupted and are inherently stable as they are constrained by kinship and norms. They are also asymmetrical and hierarchical by nature, as parents have more power and authority than their adolescent children do. In contrast, adolescent relationships with friends and romantic partners are comparable, as both types of relationships are defined as open-field or voluntarily. These relationships are formed without any biological or legal constraints and are relatively instable as either person involved can terminate the relationship at any time. Friendships and romantic relationships are also egalitarian by nature such that individuals have relatively equal status and power in these relationships. Yet, both relationships also fundamentally differ, as only romantic relationships are often

marked by expressions of affection, passion, and sexual behavior (e.g., Collins, Welsh, & Furman, 2009).

Although adolescents' relationship with parents, friends, and romantic partners have distinctive features, all of these close relationships are typically characterized by some degree of support, negative interactions, and power. Therefore, researchers often conceptualized adolescent close relationships using these three key relationship qualities (e.g., De Goede, Branje, & Meeus, 2009b; Steinberg & Silk, 2002). In this context, support refers to nurturance, warmth, connectedness and prosocial behavior in a relationship. Negative interaction includes conflicts, disagreements, and antagonism in a relationship. Power represents authority and dominance in a relationship. Among the most commonly used assessment tools for these relational constructs is the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985; Furman & Buhrmester, 1992). For assessing the quality of romantic relationships, researchers often use the additional dimensions of intimacy, passion, and commitment (e.g., Lemieux & Hale, 1999; Madey & Rodgers, 2009).

Adolescents' relationship development with parents, friends and romantic partner
Various developmental perspectives address change in parent-adolescents relationship quality across adolescence. Within the literature on parent-adolescent relationship development, the separation-individuation, the evolutionary, the maturational, and the expectancy violation-realignment perspectives particularly stand out (see review Branje, Laursen, & Collins, 2012). The separation-individuation perspective (Blos, 1967) poses that hormonal changes in puberty are the main force driving adolescents to separate themselves from their parents. According to this perspective, adolescents do so to become autonomous and independent individuals. The evolutionary perspective (Steinberg, 1989) also emphasizes the role of puberty and suggests that adolescents distance themselves from their parents as they strive for individuation in order to find a sexual partner. Finally, the maturational (Youniss & Smollar, 1985) and the expectancy violation-realignment perspectives (Laursen & Collins, 2009) suggest that adolescents aim to change the hierarchical relationship with their parents to a more egalitarian one as a result of their cognitive development during adolescence. Parents, however, may resist to these changes, resulting in less closeness and more conflicts with adolescents.

Collectively, these perspectives emphasize the role of independence and feelings of distress in the development of parent-adolescent relationships, but seem to disagree on how increasing relationship distress would affect the state of relationship quality by the end of adolescence. Specifically, both separation-individuation and evolutionary perspectives propose that increasing distress in the separation process would eventually cause a wedge between parents and adolescents, but both are silent about potential

restorations of relationships by the end of adolescence. In contrast, both maturational and realignment perspectives seem to suggest that satisfactory relationships can be (re)established by the end of adolescence, as distress is thought to diminish once the relationship is restructured.

Many empirical studies demonstrated that adolescents' increase in their desire for independence and equality toward parents is accompanied with an increase in distress. However, this distress tends to be temporary and relationship quality tends to improve by the end of adolescence. Specifically, studies identified decreases in parental authority over time, indicating that adolescents perceived more independence toward their parents (e.g., Darling, Cumsille, & Martínez, 2008; De Goede, Branje, et al., 2009b; Loeber et al., 2000). Studies also identified that distress in parent-adolescent relationships increased from early to middle adolescence, and decreased thereafter (e.g., De Goede, Branje, et al., 2009b; Keijsers, Loeber, Branje, & Meeus, 2011; Tsai, Telzer, & Fuligni, 2013; van Wel, 1994).

With regard to friendships and romantic relationships, several perspectives primarily propose that adolescents' relationships with friends and romantic partners become more close and important. For example, the developmental theory of interpersonal relationships (Sullivan, 1953) proposes that playful relationships with friends during childhood become more emotional and intimate during adolescence. In addition, the biosocial perspective (Weisfeld, 1999) suggests that adolescents' reproductive maturation stimulates their interest in romantic and sexual behavior. Thus, adolescents become more connected and intimate with their friends and romantic partners as they shift their focus from family relationships to friendships and romantic relationships (Brown, 1999; Sullivan, 1953).

Indeed, numerous studies revealed the increasing importance of friendships and romantic relationships over the course of adolescence. With regard to friendships, studies identified increasing friend intimacy and attachment (e.g., Queija, Inmaculada, & Alfredo, 2015), time spent with peers (e.g., Lam, McHale, & Crouter, 2014) and increasing friendship stability (e.g., Poulin & Chan, 2010). With regard to romantic relationships, studies indicated an accumulation of adolescents' romantic experiences over time (e.g., Carver, Joyner, & Udry, 2003; Shulman & Scharf, 2000). There is also evidence for adolescents' romantic relationships becoming more exclusive (e.g., Meier & Allen, 2009), of longer duration (e.g., Seiffge-Krenke, 2003), and more emotionally intimate (e.g., Meeus, Branje, Valk, & Wied, 2007; Shulman & Scharf, 2000).

Parent-adolescent relationship influences on friendships and romantic relationships.

Developmental changes in different types of interpersonal relationships that adolescence are involved seem to be intertwined. Specifically, the relationship with parents are thought to play a fundamental role in the formation of friendships and romantic relationships. Some literature suggest a spillover phenomenon. This phenomenon entails that the relationship quality with parents and friends and/or romantic partner become relatively concordant as the relational quality in one domain generalizes to the other domain. For example, the attachment perspective (Bowlby, 1978) states that adolescents form mental representations based on the relationship history with their parents and that they use these relationship models to deal with other interpersonal relationships. The social cognitive perspective (Bandura, 1977) suggests that adolescents' relationship history with their parents affects their interpersonal relationships through modeling and imitation. Thus, these two perspectives predict continuity of relationship quality from the family context to the friend and romantic context. A tumultuous family context would thus relate to difficulties in other interpersonal relationships, whereas a supportive family context would relate to more closeness in other relationships.

Other studies suggests a compensation phenomenon (e.g., Helsen, Vollebergh, & Meeus, 2000; Scholte, van Lieshout, & van Aken, 2001). This phenomenon entails that adolescents' relationships with parents and friends and/or romantic partners become relatively discordant as adolescents compensate the lack of connectedness in one relationship by seeking for connectedness in another relationship. The turn-to-friends hypothesis as a specific compensation phenomenon suggests that adolescents who experience a tumultuous relationship with their parents compensate the lack of connectedness with their parents by turning to their friends or romantic partner for support (e.g., Helsen et al., 2000). Similarly, those with tumultuous friendships or romantic relationships would compensate the absence of connectedness by having close family relationships as they turn to family for support.

There is compelling evidence for parent-adolescent relationship influences on friendships and romantic relationships. In terms of friendships, studies generally provided support for both spillover and compensation phenomena. Some studies provided support for the spillover phenomenon, for example, by revealing positive associations between adolescents' relationship representations of parents and friends (e.g., Furman & Collibee, 2016; De Goede, Branje, Delsing, & Meeus, 2009; Stice, Ragan, & Randall, 2004). Other studies provided support for the compensation phenomenon, for example, by revealing negative associations between adolescents' relationship with parents and friends by revealing that a poor relationship with parents is linked to a stronger attachment to friends (e.g., Markiewicz, Lawford, Doyle, & Haggart, 2006). Thus, studies generally

suggest that both phenomena could be present in friendships, but that they emerge in different groups of individuals (e.g., Kan & McHale, 2007).

In terms of romantic relationships, studies have consistently provided support for the spillover phenomenon by demonstrating that a supportive relationship with parents relate to satisfactory and committed romantic relationship quality (e.g., Conger, Cui, Bryant, & Elder, 2000; Fosco, Van Ryzin, Xia, & Feinberg, 2016; Johnson & Galambos, 2014; Kretschmer et al., 2017; Scharf & Mayseless, 2001; Walper & Wendt, 2015). However, studies on adolescent sexual behavior have mainly provided support for the compensation phenomenon. Adolescents in a tumultuous relationship with parents tend to have earlier sexual debut (e.g., de Graaf, van de Schoot, Woertman, Hawk, & Meeus, 2012), report having more sex partners (e.g., Roche, Ahmed, & Blum, 2008), and show more risky sexual behavior (e.g., Kim, Gebremariam, Iwashyna, Dalton, & Lee, 2011). Altogether, research shows that the spillover phenomenon is mainly present for the quality of romantic relationships, while the compensation phenomenon appears to be mainly reflected in adolescents' sexual behavior.

Variable-centered and Person-centered Approaches in Relationship Research

A wealth of research has revealed adolescents' personal relationship development and the importance of parent-adolescent relationships on friend and romantic relationships, but most research is variable-centered. Such approaches generally focus on singular relational variables to provide information valid for the average individual in the sample (e.g., correlations, regressions, path analyses). Despite the important findings that have been obtained with variable-centered approaches, these are limited in two ways in examining relationship experiences.

First, these approaches fail to capture the multidimensional nature of relationship quality as they usually include one relational variable to measure adolescent relationship quality (e.g., support, or negative interaction, or power). This is a limitation because the meaning of a relationship quality depends on multiple relational dimensions. For example, high power perceived by adolescents could represent a cooperative authoritative relationship when combined with high levels of adolescents' perceived support. In contrast, high power perceived by adolescents may illustrate a repressive hierarchical relationship when combined with low levels of adolescents' perceived support. Another example comes from the parenting profiles of Baumrind (1991) constellated by parenting dimensions of support and demandingness. For example, authoritative parenting

reflects high levels of demandingness as well as high levels of support from parents to child, whereas authoritarian parenting reflects high levels of demandingness and low levels of support from the parent to child. These examples thus show the importance of constellating multiple relationships dimensions rather than using singular dimensions for understanding the exact quality of a relationship.

Second, variable-centered approaches only provide information for the average individual in the sample that might not be true for subsamples deviating from this average. This is a limitation because obviously not all individuals experience similar relationship experiences and variable-centered approaches neglect this potential heterogeneity. In addition, this approach cannot simultaneously examine the extent to which findings conform to various developmental perspectives. For example, some findings may support the maturational (Youniss & Smollar, 1985) and expectancy violation-realignment (Laursen & Collins, 2009) perspectives by showing that certain adolescents improve the relationship quality with parents by the end of adolescence. In contrast, other findings may not provide support for these theories by showing that some adolescents worsen or do not improve the relationship quality with parents. Additionally, some findings may support the spillover phenomenon (e.g., Bandura, 1977; Bowlby, 1978) by showing that the quality of the adolescent's relationship with their parents is similar to the quality of their friendships and romantic relationships. In contrast, other findings may support the compensation phenomenon (e.g., Helsen et al., 2000) by showing that adolescents compensate the relationship with parents by turning to friends or romantic partners. This shows the potential heterogeneity in development that can occur and further underscores the importance of examining individual differences in adolescents' relationship experiences.

One way to capture the multidimensional nature of relationships and the potential individual differences that can occur in relationships is to apply a person-centered approach. Person-centered approaches can produce relationship quality profiles of different relational aspects and as such identify individual differences in relationship quality (e.g., cluster analysis, latent profile analysis). These approaches can also be extended longitudinally to allow for the examination of individual differences in relationship quality development over time. Capturing these over-time changes is crucial because of the many developmental changes that occur in adolescents' relationship with parents (e.g., Blos, 1967; Collins et al., 2009; Youniss & Smollar, 1985). Person-centered approaches in a longitudinal study design are therefore ideal for examining adolescents' relationship development with parents and the influences of this relationship development on friendships and romantic relationships. Until now, however, longitudinal person-centered studies are scarce.

Aims and Outline of the Thesis

The aim of the current thesis is twofold. The first aim is to examine individual differences in adolescent relationship quality development with parents by applying a person-centered approach. Specifically, it will be examined whether a replicable parent-adolescent relationship typology can be generated, using multiple relational dimensions (i.e., support, negative interaction, and power). The second and the third chapter of this thesis will mainly address this aim. Specifically, **the second chapter** aims to produce a reliable and valid parent-adolescent relationship quality typology and to examine the value of an adjusted person-centered approach compared to the variable-centered approach. In addition, **the third chapter** aims to examine the typical and atypical patterns of parent-adolescent relationship development by producing parent-adolescent relationship quality profiles and to examine the change and stability patterns of each of these relational profiles.

The second aim is to examine how the relationship quality with parents continues into the quality of friendships and romantic relationships. The fourth and fifth chapter of this thesis will mainly address this aim. Specifically, **the fourth chapter** aims to examine the extent to which the relationship quality with parents would spillover or compensate the relationship quality with best friend in normative and anxious adolescents. **The fifth chapter** aims to examine the extent to which various parent-adolescent relationship quality trajectories spillover to adolescent as well as their romantic partner perceptions on romantic relationship quality.

Study Design

Table 1 presents an overview of the study designs and measures of the studies presented in this thesis. With regard to the study design, the studies presented in the second, third, and fourth chapter used data from the Conflict and Management of Relationships (CONAMORE) study in The Netherlands. Only the study presented in the fifth chapter used data from the Research on Adolescent Development and Relationships (RADAR) study in The Netherlands.

Furthermore, only the study presented in the second chapter used cross-sectional data while the studies presented in the third, fourth, and fifth chapter used longitudinal data. Most of these longitudinal studies used annual assessments of relationship quality. Only the study presented in the fifth chapter also included bi-annual assessments of relationship quality. Additionally, studies presented in the second to the fourth chapter

included an early-to-middle and middle-to-late adolescent cohort samples, while the study presented in the fifth chapter included only one cohort.

The studies included in the current thesis mainly used self-report measures. Most of these measures assessed the relationship quality of adolescents. However, the study presented in the fifth chapter used multi-informant data. Studies generally used the Network of Relationship Inventory (Fuhrman & Buhrmester, 1985; 1992), which assessed the levels of support, negative interaction, and power in the relationship with parents, best friend, and/or romantic partner. The study of the fifth chapter added the Triangular Love Scale (Steinberg, 1986) to measure the other romantic relational dimensions of intimacy, passion, and commitment. Relatedly, in Chapter Four the anxiety levels of adolescents were assessed in addition to their relationship quality. For this purpose, this study included the Screen for Child Anxiety Related Emotional Disorders (e.g., Birmaher et al., 1997) to assess adolescents' levels of generalized anxiety disorder symptoms and to differentiate between normative and anxious adolescents.

Table 1
Overview of Research Goals and Study Designs of Studies Included in the Thesis

Chapter	Research goals	Design	Age-period	Demographics	Relationship quality	Measures	Informant
2	To identify a reliable and valid parent-adolescent relationship quality typology and to investigate the merits of an adjusted person-centered approach compared to the variable-centered approach	Conamore study; crosssectional, early and late cohort sample	12 and 16 for the early and late cohort, respectively	N = 2,281; 49% and 51% females; M_{age} = 12.5 and 16.9 years for early and late cohort, respectively	Parent-adolescent relationships	NRI: support, negative interaction, and power	Adolescent
3	To explore the typical and atypical patterns of parent-adolescent relationship development by examining the change and stability patterns in parent-adolescent relationship quality profiles	Conamore study; longitudinal, early and late cohort sample, five-waves annual measures	12 –16 and 16 - 20 for the early and late cohort, respectively	N = 1,313; 49% and 57% females; M_{age} = 12.4 and 16.7 years at the first wave for early and late cohort, respectively	Parent-adolescent relationships	NRI: support, negative interaction, and power	Adolescent
4	To investigate the extent to which the relationship quality with parents spillover or compensates the relationship quality with best friend in normative and anxious adolescent sample	Conamore study; longitudinal, early and late cohort sample, five-waves annual measures	12 –16 and 16 - 20 for the early and late cohort, respectively	N = 1,313; 49% and 57% females; M_{age} = 12.4 and 16.7 years at the first wave for early and late cohort, respectively	Parent-adolescent relationships; friendships	NRI: support, negative interaction, and power; SCARED: generalized anxiety disorder symptoms	Adolescent
5	To identify a typology of parent-adolescent relationship trajectories using adolescent and parental reports on relationship and to examine their influence on adolescents' romantic relationships	Radar study; longitudinal, six-waves annual and two-waves bi-annual measures	13 to 18 and from 20/21 to 22/23	N = 759; 47% females; M_{age} = 13.11 years at the first wave	Parent-adolescent relationships; Romantic relationships	NRI: support and power; TLS: intimacy, passion, and commitment	Adolescent, parents, and romantic partners

Note. Demographics only describe the characteristics of the adolescent sample. NRI = Network of Relationship Inventory. SCARED = Screen for Child Anxiety Related Emotional Disorders. TLS = Triangular Love Scale.

Chapter 2

Parent-Adolescent Relationships: An Adjusted Person-Centered Approach

Hadiwijaya, H., Klimstra, T.A., Vermunt, J.K., Branje, S.J.T., & Meeus, W.H.J. (2015). Parent-adolescent relationships: An adjusted person-centered approach.

European Journal of Developmental Psychology, 12, 728-739.

Abstract

Person-centered approaches classify individuals with similar attributes in the same group and describe differences between these groups of individuals. However, these approaches are scarcely used, partly due to their low predictive power. This study aims to overcome previous limitations by using an adjusted person-centered procedure to identify a reliable and valid parent-adolescent typology and demonstrate the value of an adjusted approach. Adolescents (N= 2281, 49% males, M_{age}= 14.35, SD_{age}= 2.33) completed self-reports regarding relationship quality, psychopathology, and personality. Harmonious, average, turbulent, and detached relationship types were identified and replicated. These types showed external validity, as they displayed distinctive patterns in psychopathology and personality. The adjusted procedure clearly increased predictive power, as it explained more variance in outcomes when compared to the standard procedure. The present study contributes to adolescent research by identifying a reliable and valid parent-adolescent relationship typology, and demonstrating the value of an adjusted person-centered approach.

Similar to personality profiles, relationship profiles can be viewed as dynamic organizations in which relational components function as configured rather than isolated systems (Allport, 1937). Person-centered approaches (e.g., cluster analysis, latent class analysis) produce such profiles by *grouping individuals into classes* using configurations of components in which each class includes individuals who are similar to each other and different from those in other classes (Asendorpf, 2006). For instance, configurations of responsiveness and demandingness revealed a parenting typology including authoritative (responsive and demanding), authoritarian (non-responsive and demanding), midrange (moderate responsive and demanding), indulgent (responsive and undemanding), and negligent (non-responsive and undemanding) parenting profiles (e.g., Baumrind, 1991; Slicker, 1998).

However, the person-centered approaches that are typically used (e.g. cluster analysis, latent class analysis) are plagued by low predictive power due to individual classification errors. That is, individuals assigned to a class may also express some characteristics of other classes (Asendorpf, 2006), as illustrated in Table 1. Because classes may include inaccurately assigned individuals, this introduces classification errors. No adjustment for these errors produces low predictive power and limits the identification of linkages of profiles with, for instance, behavioral problems. Therefore, adjustment for the classification errors inherent to person-centered approaches is needed. A newly developed three-step procedure addresses this limitation by adjusting for classification inaccuracy, thereby providing greater predictive power (e.g., Bakk, Tekle, & Vermunt, 2013; Vermunt, 2010).

Table 1
An Example of Three Individuals (A, B, C) having Non-Zero Classification Probabilities for Each of the Three Classes

	Classification probabilities		
	Class 1	Class 2	Class 3
Individual A	0.80	0.10	0.10
Individual B	0.10	0.75	0.15
Individual C	0.15	0.15	0.70

Note. Rows display the classification probabilities: e.g., individual A has 80% chance to belong to Class 1, 10% chance to belong to Class 2, and 10% chance for Class 3. In general, individuals are assigned to the class for which the classification probability is the largest (individual A would be assigned to Class 1, B to Class 2, and C to Class 3). However, as they do not have a 100% probability to belong to the assigned class, their class assignments are imperfect and include classification errors.

Partly because of the limited predictive power of unadjusted person-centered approaches, most relationship research has applied variable-centered approaches. Such variable-centered approaches (e.g., correlations, regression analysis) focus on *associations between variables* (e.g., linking interindividual differences in parent-adolescent quality to interindividual differences in well-being) and not on configurations of characteristics. Thereby, these approaches ignore the notion that relationships are structured as dynamic organizations (Allport, 1937). A more comprehensive understanding of parent-adolescent relationships will likely be obtained by applying an adjusted person-centered approach to define a typology in which configurations of relationship components are preserved.

To build a typology of parent-adolescent relationships, three key components defining this relationship are of importance: power, support, and conflict (Furman & Buhrmester, 1985). Power represents dominance and equality, support refers to nurturance and prosocial behavior, and conflict include negative interactions and antagonism. These components are also represented in Steinberg and Silk's (2002) parent-adolescent relationship domains and are often used in conceptualizations of parent-adolescent relationships (e.g., De Goede, Branje, & Meeus, 2009).

Until now, no study has applied a person-centered approach to identify a typology of parent-adolescent relationships using all these key components. Relatedly, in many developmental studies classification errors remain unaccounted for if person-centered approaches are applied. In addition, no study has yet demonstrated the incremental value of an adjusted approach in which classification errors are accounted for, over the standard approach in which these errors remain unaccounted for. Therefore, the aim of this study is twofold: 1) applying an adjusted person-centered procedure to identify a reliable and valid global parent-adolescent typology, and 2) investigating the merits of an adjusted approach compared to the standard approach.

As no research has identified a typology using the three key relationship components, we based our hypothesis on the extended parenting typology of Baumrind (1991; Slicker, 1998) in which only responsiveness (similar to support) and demandingness (similar to power) were configured. We expected to find relationship types representing authoritative (high on support and power), authoritarian (low on support, high on power), midrange (moderate support and power), indulgent (high on support, low on power), and negligent (low on support and power) profiles. Furthermore, we expected that relationship types derived with the adjusted approach would provide greater predictive power than relationship types derived with the standard approach (Vermunt, 2010).

Method

Participants and Procedure

Data for the current study were collected as part of a Dutch longitudinal project Conflict and Management of Relationships (CONAMORE) approved by the local institutional review board. Initially, 2391 adolescents participated. Adolescents with missing values on relationship quality variables were excluded from the analyses as these variables defined our typology. Adolescents with missing values on other variables were included in the analyses. Little's (1988) Missing Completely at Random test indicated that the data were likely missing at random ($\chi 2/df = 1.90$; Bollen, 1989), suggesting that adolescents with missing data were similar to those with complete data. This justifies our approach to handling missing data.

The final sample included 2281 adolescents (49% males, $M_{age} = 14.35$, $SD_{age} = 2.33$), including two age groups: early-to-middle adolescents (n = 1293; 51% males, M_{age} = 12.45, $SD_{age} = 0.61$, range 10-15 years) and middle-to-late adolescents (n = 988; 43% males, $M_{age} = 16.87$, $SD_{age} = 0.98$, range 16 – 24 years). Adolescents were recruited from various high schools in the province of Utrecht, The Netherlands, and they were all in junior high and high schools. Most participants were Dutch (81%), whereas others belonged to the largest ethnic minorities in The Netherlands (e.g. Surinamese, Antillean, Moroccan).

Measures

A comprehensive information regarding all measures can be found in Table 1 of the supplementary material. This table provides example items and psychometric properties for each measure.

Relationship quality. The Network of Relationships Inventory (Furman & Buhrmester, 1985) was used to measure adolescents' perceptions of adolescent-mother and adolescent-father relationship quality based on parental power (6 items), support (12 items), and conflict (6 items) on a 5-point Likert scale. Scores for adolescent-mother and adolescent-father relationship quality on each component were collapsed, as our study aimed to identify a global relationship typology. Principal component analysis showed that the underlying factors are similar to the three NRI components in general. Thus, these factors are not necessarily different for adolescent relationship with mother or father.

Psychopathology. The Children's Depression Inventory (Kovacs, 1985) was used to measure adolescents' *depressive symptoms* on a 3-point Likert scale (27 items). The Screen for Child Anxiety Related Emotional Disorders (Birmaher et al., 1997) was used to measure *anxiety* on a 3-point Likert scale (38 items). The Direct and Indirect Aggression

Scale (Björkqvist, Lagerspetz, & Kaukiainen, 1992) was used to measure *direct aggression* (5 items) and *indirect aggression* (12 items) on a 4-point Likert scale. **Personality.** The 30-item Quick Big Five (Vermulst & Gerris, 2005) was used to measure adolescents' personality traits of Openness, Conscientiousness, Extraversion, Agreeableness, and Emotional Stability. Each trait was assessed by six items on a 7-point Likert scale.

Analytic Strategy

Analyses were performed in Latent GOLD 5.0 (Vermunt & Magidson, 2013). Specifically, a three-step adjusted person-centered procedure was performed to identify a parent-adolescent relationship typology and to demonstrate the value of this approach compared to the standard approach (i.e., a latent class analysis in which no classification errors were taken into account) (Asparouhov & Muthén, 2014; Bakk et al., 2013).

First, a latent class analysis (LCA) was conducted to identify a parent-adolescent relationship typology. LCA is a person-centered analytic method that groups individuals into classes based on their pattern of scores across variables (i.e., power, support, and conflict). Similar to cluster analysis, LCA generates measurement and structural parameters (Nylund, Asparouhov, & Muthén, 2007), but it also offers fit statistics and significance tests to identify the number of classes. Class membership assignment is determined based on class probabilities. Three criteria were used to determine the number of latent classes: the Bayesian information criterion (BIC; Schwarz, 1978) should be the lowest, the solution with k+1 class should lead to an improvement in model fit as indicated by a significant bootstrap likelihood ratio (BLRT; Nylund et al., 2007), and the most parsimonious solution should be selected if an additional class in a k class model represented a variation of a solution with k–1 class.

In the second step, we computed the probability of belonging to each of the classes using adolescents' scores on power, support, and conflict. These classification probabilities are subsequently used to assign each adolescent to the class for which the classification probability is largest. Note that classifications would be perfect if the largest classification probability equals 1 for each adolescent. As this is clearly not the case, classification errors are introduced when assigning individuals to classes. However, classification error probabilities can be computed and used in the adjustment procedure applied in the third step. For instance, when computing the mean of the first class, the procedure takes into consideration that adolescents belonging to the first class also have a certain probability to be assigned to the second, third, or fourth class. The procedure adjusts for such classification errors by reweighting adolescents' assigned class memberships by the inverse of the misclassification probabilities.

In the third step, the adjusted classifications were used in an ANOVA to estimate differences across relationship types on psychopathology and personality and the predictive power of the types, controlled for gender and age. Note that other analyses using the adjusted classifications can also be performed in the third step (e.g., multilevel, regression), as these classifications can be used to estimate the association between the latent variable and other variables (in this case, psychopathology and personality) (Bakk et al., 2013).

Results

Results of the first step are shown in Table 2 in which solutions up to six classes led to lower BIC and significant BLRT values, suggesting that each additional class contributed to model fit improvement. However, the five-class solution appeared to be the most parsimonious, as the sixth class appeared to be a slight variation of one of the five classes (see Figure 1). The fourth-class solution was rejected as it showed less model fit than the fifth class and missed a unique class that the fifth class provided. Therefore, the five-class solution was chosen as the final model. Additionally, the second and third class of this five-class solution were merged into one class as they were very similar to each other (Hennig, 2010). The final typology was thus a five-class solution integrated into four classes (Figure 2). The entropy value of this four-class model was acceptable (.64). To ensure that the current solution was *reliable*, the total sample was randomly split (I= 1160; II= 1121) and identical classes were obtained (see Figure 1 and 2 of the supplementary material). The classes we found were a *harmonious* class (48%; average levels of power, high levels of support, and low levels of conflict), an *average* class (38%; levels of power, support, and conflict around the sample mean), a *turbulent* class (9%; high levels of power and conflict, low levels of support), and a *detached* class (5%; low levels of all relationship quality variables).

Table 2
Latent class analysis model fit indicators

Class solutions	Log likelihood	BIC[a]	BLRT p-value[b]
1	-6306.80	12660.10	0.00
2	-5782.51	11665.54	0.00
3	-5282.65	10719.94	0.00
4	-5100.17	10409.11	0.00
5	-4970.05	10202.99	0.00
6	-4866.10	10048.97	0.00

Note. [a]Bayesian information criteria. [b]Bootstrap likelihood ratio.

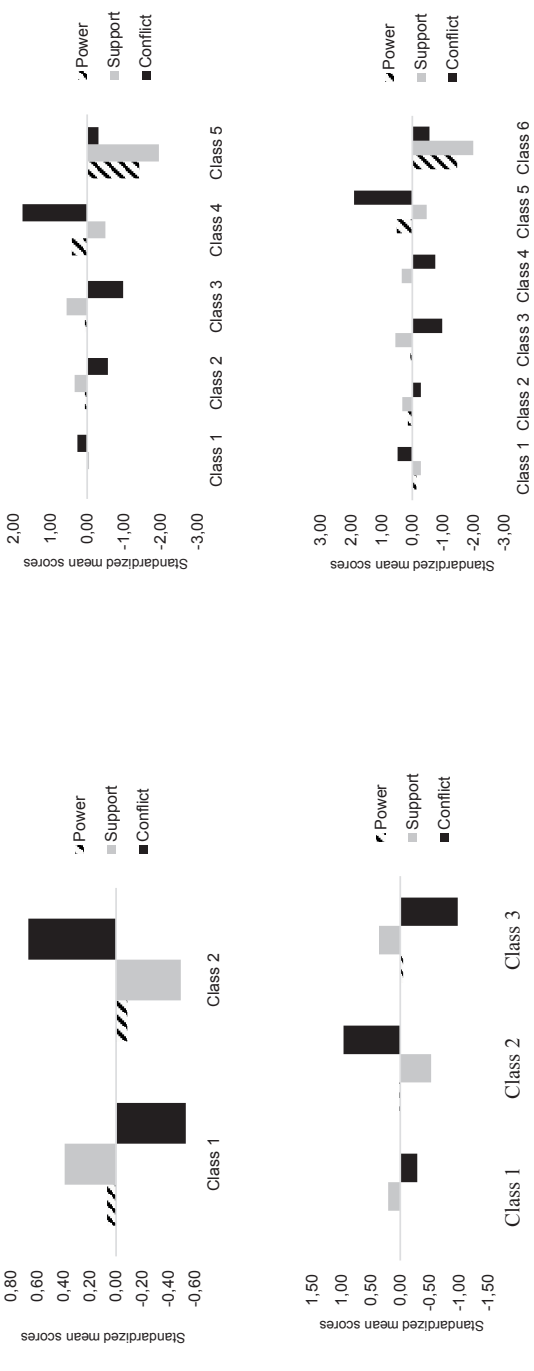

Figure 1
Parent-adolescent relationship profiles for solutions up to six classes based on perceived parental power, support, and parent-adolescent conflict (N= 2,281).

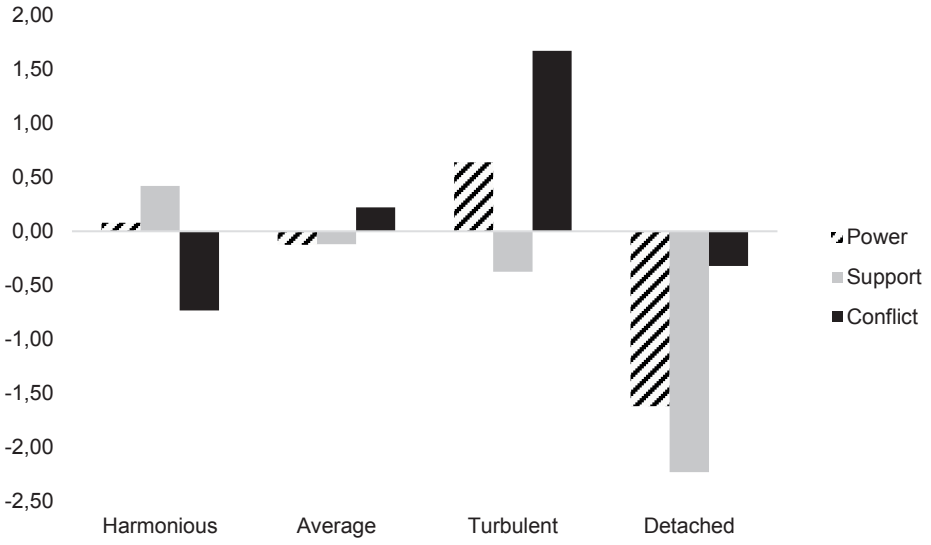

Figure 2
Integrated four-class solution profiles of parent-adolescent relationships based on perceived parental power, support, and parent-adolescent conflict (N= 2,281). Parental power and support scores of the average class and parental power scores of the harmonious class were slightly adjusted as values of these classes were on a similar level as the x-axis and thus barely visible.

Table 3 shows the class assignments derived from the second step. When computing the probability of belonging to each of the classes using adolescents' scores on relationship quality, the probabilities of the second and third class from the five-cluster solution were summed in current four-class typology.

Table 3
Classification Assignments for the Integrated Four-Class Solution

	Harmonious	Average	Turbulent	Detached
Harmonious	824. 65	141. 78	9.15	8.81
Average	141. 78	646.62	80.18	21.49
Turbulent	9.61	80.18	189.57	4.93
Detached	12. 13	21.49	4.93	79.93
Total	988. 16	890.06	284.29	118.48

Note. This table was based on proportional assignments of classes in which individual probabilities of belonging into each of the four classes were considered for.

Results of the third step can be found in Table 4, which also displays the sample size and mean scores of relationship quality for each relationship type. The harmonious and average class displayed similar levels of power, but other than that all types displayed significantly different patterns of relationship quality. This table also shows that adolescents with a harmonious relationship displayed the least psychopathology and the best-adjusted personality profile (i.e., highest scores on personality traits). Adolescents in an average relationship showed a profile in-between the other classes. Adolescents with a turbulent relationship displayed more psychopathology and a less-adjusted personality profile than adolescents with harmonious or average relationships. Adolescents in a detached relationship showed less psychopathology than those in a turbulent relationship, but were also less open and agreeable. Moreover, Table 5 shows that the adjusted procedure systematically explained more variance (i.e., almost twice as much) as the standard approach in which classification errors remained unaccounted for.

Table 4
Adjusted Three-step Method ANOVA Mean Comparisons of Relationship Types on Relationship Quality, Psychopathology and Personality

Variables	Harmonious (n = 1084)	Average (n = 873)	Turbulent (n = 217)	Detached (n = 107)	Total (n = 2281)	Wald value
	M (SD)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M (SD)*	
Gender (% males)	49[ab]	48[ab]	40[ab]	64[c]	47	5.35
Age	14.04 (2.28)[b]	14.45 (2.32)[a]	15.29 (2.23)[c]	14.81 (2.45)[c]	14.35 (2.33)	73.55*
Relationship quality						
Power	2.58 (0.66)[a]	2.55 (0.53)[a]	2.88 (0.81)[b]	1.55 (0.35)[c]	2.55 (0.66)	1085.59*
Support	3.65 (0.51)[a]	3.34 (0.53)[b]	3.01 (0.75)[c]	1.95 (0.48)[d]	3.39 (0.66)	8525.43*
Conflict	1.14 (0.13)[a]	1.70 (0.23)[b]	2.65 (0.53)[c]	1.32 (0.29)[d]	1.50 (0.51)	559.14*
Psychopathology						
Depression	1.13 (0.20)[a]	1.20 (0.27)[b]	1.38 (0.37)[c]	1.24 (0.34)[bc]	1.19 (0.26)	121.10*
Anxiety	1.28 (0.28)[a]	1.34 (0.32)[b]	1.48 (0.39)[c]	1.34 (0.36)[ab]	1.33 (0.32)	46.59*
Indirect aggression	1.32 (0.40)[a]	1.44 (0.45)[b]	1.62 (0.62)[c]	1.44 (0.51)[ab]	1.40 (0.46)	73.93*
Direct aggression	1.42 (0.53)[a]	1.56 (0.59)[b]	1.67 (0.74)[c]	1.50 (0.56)[ab]	1.50 (0.58)	44.80*
Big Five personality						
Openness	4.52 (1.14)[a]	4.48 (1.06)[b]	4.67 (1.13)[ab]	3.99 (1.44)[c]	4.50 (1.13)	13.85*
Conscientiousness	4.43 (1.21)[a]	4.09 (1.14)b	3.89 (1.31)[c]	4.15 (1.30)[bc]	4.23 (1.21)	56.89*
Extraversion	4.90 (1.15)[a]	4.74 (1.08)[a]	4.54 (1.31)[ab]	4.44 (1.16)[b]	4.78 (1.15)	26.94*
Agreeableness	5.26 (1.10)[a]	5.12 (0.96)[b]	5.08 (1.11)[b]	4.66 (1.50)[c]	5.16 (1.08)	25.87*
Emotional stability	4.67 (1.17)[a]	4.41 (1.12)[b]	3.92 (1.20)[c]	4.54 (1.53)[abc]	4.49 (1.19)	58.41*

Note. *p <.001. Comparisons of classes on psychopathology and personality were controlled for gender and age. Different superscripts represents significant mean-levels differences between samples, two-tailed test (p <.05). Samples with different superscripts across rows differ from one another with regard to psychopathology and personality.

Table 5
Explained Variance of Parent-Adolescent Relationship Typology on Psychopathology and Personality Using the Standard and Adjusted Approach

	Standard approach R^2	Adjusted approach R^2
Psychopathology		
Depression	0.08	0.13
Anxiety	0.04	0.05
Indirect aggression	0.04	0.07
Direct aggression	0.02	0.04
Big Five personality		
Openness	0.01	0.02
Conscientiousness	0.03	0.05
Extraversion	0.01	0.03
Agreeableness	0.02	0.03
Emotional stability	0.03	0.05

Note. The standard approach was conducted using an ANOVA in SPSS 19.0 in which no classification inaccuracy was taken into account whereas this inaccuracy was considered for in the ANOVA using the adjusted procedure performed in Latent GOLD 5.0.

Discussion

Applying an adjusted person-centered approach to three key relationship components identified four replicable parent-adolescent relationship types. These types also showed external validity as they were systematically linked to psychopathology and personality. Additionally, the adjusted person-centered approach proved to enhance the predictive power of the types when compared to an unadjusted standard approach.

Our findings partly support our hypothesis based on a parenting typology (Baumrind, 1991; Slicker, 1998), as we identified types representing midrange (average), authoritarian (turbulent), and negligent (detached) profiles. However, the harmonious profile fell in between the authoritative and indulgent parenting type as adolescents in this relationship type reported that their parents were supportive, and nor strict nor permissive. This type might represent an egalitarian relationship in which adolescents experience reciprocity and equality in their interactions with parents (Youniss & Smollar, 1985). Overall, our typology seems to be a meaningful addition next to Baumrind's (1991; McKinney & Renk, 2008) parenting typology, as it specifically concerned a typology of relationship quality and also enclosed the conflict aspect of relationships.

Furthermore, we found evidence for the adjusted procedure explaining more variance in psychopathology and personality than the standard procedure. This indicates that the adjusted approach enhanced the predictive power of relationship types. Our study thus overcame a major problem in previous person-centered studies: the low predictive power (e.g., Asendorpf, 2006). This method therefore likely brightens the future of person-centered research.

Two notions warrant mention here. First, most adolescents perceived a harmonious or average relationship with their parents, and only 14% experienced a turbulent or detached relationship. Our findings therefore support the modified storm-and-stress theory (Arnett, 1999) by showing that only a subgroup of adolescents experienced a turbulent relationship with their parents. Second, a detached relationship was not associated with increased risk for psychopathology, but was related to a less open and less agreeable personality. Traits representing a rigid personality may thus be linked to less close relationships. This finding is similar to previous research, in which an avoidant attachment style was characterized by a less compassionate personality (e.g., Noftle & Shaver, 2006).

An important limitation of the current study is the *global* examination of parent-adolescent relationship types rather than examining and/or combining *unique* maternal and paternal relationship characteristics with adolescent. Some adolescents could, for instance, have good relationships with mothers, but worse relationships with fathers or vice versa (e.g., Youniss & Smollar, 1985). Nevertheless, a global approach of a parent-adolescent relationship typology seemed an appropriate starting point to demonstrate the merits of an adjusted person-centered method for adolescent relationship research. Future research is needed to explore other potential typologies of adolescents' relationships. Additionally, the developmental patterns and outcomes of relationship types throughout the adolescence need to be investigated.

The present study has several important implications. First and foremost, we demonstrated the value of an adjusted person-centered approach by accounting for classification errors and thereby increasing the predictive power of relationship types. Second, our typology provides a better understanding of parent-adolescent relationships by considering the configuration of all key relationship components simultaneously. These typologies are also easy to communicate to healthcare professionals interested in relationship characteristics putting adolescents at risk for psychopathology, as typological classifications (e.g. diagnoses) are frequently used in applied settings.

Supplementary material

Table 1
An Overview of Example Items and Psychometric Properties for All Measures

Variable	Measure	Example item	Reliability	Validity
Relationship quality				
Power	The Network of Relationships Inventory (Furman & Buhrmester, 1985).	"To what extent is your mother the boss in your relationship?"	α = 0.83, 0.88, 0.88; and CR = 0.83, 0.88, 0.088 for adolescent-mother, adolescent-father, and adolescent-parents respectively	The scale has good psychometric properties (e.g., Furman, 1996).
Support	The Network of Relationships Inventory (Furman & Buhrmester, 1985).	"How much does your mother really care about you?"	α = 0.89, 0.92, 0.92; and CR= 0.90, 0.92, and 0.92 for adolescent-mother, adolescent-father, and adolescent-parents respectively	
Conflict	The Network of Relationships Inventory (Furman & Buhrmester, 1985) .	"Do you and your mother get on each other's nerves?"	α = 0.89, 0.92, 0.92; and CR = 0.89; 0.92, 0.92 for adolescent-mother, adolescent-father, and adolescent-parents respectively	
Psychopathology				
Depression	The Children's Depression Inventory (CDI; Kovacs, 1985).	"I worry all the time about all kind of things"	α = 0.93; CR = 0.94	The CDI has good construct validity (see review Sitarenios & Kovacs, 1999).
Anxiety	The Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997).	"I get really frightened for no reason at all"	α = 0.95; CR = 0.97	The SCARED has shown good validity (Muris, Merckelbach, Ollendick, King, & Bogie, 2002).
Direct agression	The Direct and Indirect Aggression Scale (DIAS; Björkqvist, Lagerspetz, & Kaukiainen, 1992).	"I will kick or hit him (or her)"	α = 0.88; CR = 0.88	The DIAS has high construct validity (Österman et al., 1998).
Indirect agression	The Direct and Indirect Aggression Scale (Björkqvist et al., 1992).	"I will use abusive language about him or her in every situation"	α = 0.91; CR = 0.91	

Personality				
Openness	The 30-item Quick Big Five (Goldberg, 1992).	'creative'	α = 0.79; CR = 0.79	Good validity was found for this inventory (e.g., Scholte, van Lieshout, de Wit, & van Aken, 2005).
Conscientiousness	The 30-item Quick Big Five (Goldberg, 1992).	'organized'	α = 0.84; CR = 0.85	
Extraversion	The 30-item Quick Big Five (Goldberg, 1992).	'talkative'	α = 0.80; CR = 0.81	
Agreeableness	The 30-item Quick Big Five (Goldberg, 1992).	'cooperative'	α = 0.88; CR = 0.88	
Emotional Stability	The 30-item Quick Big Five (Goldberg, 1992).	'stable'	α = 0.83; CR = 0.84	

Note. CR = Composite reliability. This reliability is reported as an alternative to Cronbach's alpha and indicates the extent that the scale indicators represent a particular factor (Fornell & Larcker, 1981).

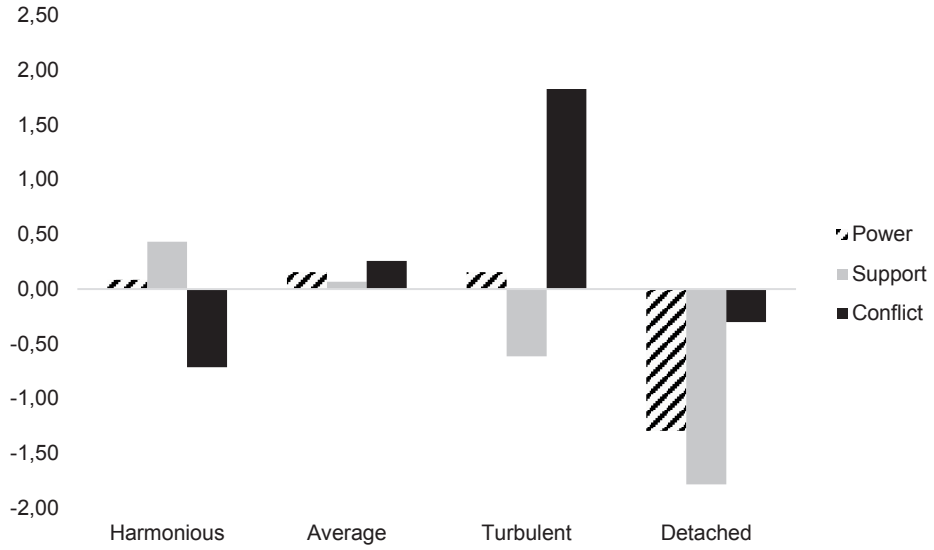

Figure 1
Sample I profiles of parent-adolescent relationships derived from the split-halves method. Graphic shows the profiles of parent-adolescent relationships for subsample I (*N*= 1160) based on perceived parental power, support, and parent-adolescent conflict using a five-class solution that was integrated into a four-class model. Parental power scores of the harmonious class were slightly adjusted as values of these classes were on a similar level as the x-axis and thus barely visible.

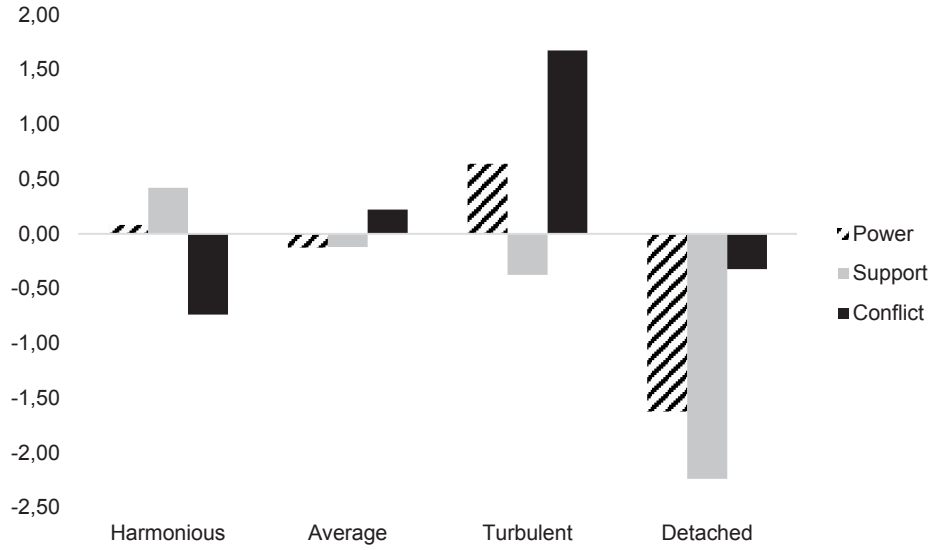

Figure 2
Sample II profiles of parent-adolescent relationships derived from the split-halves method. Graphic shows the profiles of parent-adolescent relationships for subsample II (*N*= 1121) based on perceived parental power, support, and parent-adolescent conflict using a five-class solution that was integrated into a four-class model. Parental power scores of the harmonious class were slightly adjusted as values of these classes were on a similar level as the x-axis and thus barely visible.

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Chapter 3

On the Development of Harmony, Turbulence, and Independence in Parent-Adolescent Relationships

Hadiwijaya, H., Klimstra, T.A., Vermunt, J.K., Branje, S.J.T., & Meeus, W.H.J. (2015). On the Development of Harmony, Turbulence, and Independence in Parent-Adolescent Relationships: A Five-Wave Longitudinal Study.

Journal of Youth and Adolescence, 46, 1772-1788.

Abstract

The separation-individuation, evolutionary, maturational, and expectancy violation-realignment perspectives propose that the relationship between parents and adolescents deteriorate as adolescents become independent. This study examines the extent to which the development of adolescents' perceived relationship with their parents is consistent with the four perspectives. A latent transition analysis was performed in a two-cohort five-wave longitudinal study design covering ages 12 to 16 (n = 919, 49.2% female) and 16 to 20 (n = 392, 56.6% female). Generally, from 12 to 16 year adolescents moved away from parental authority and perceived increasing conflicts with their parents, whereas from 16 to 20 years adolescents perceived independence and improved their relationships with parents. Hereby, we also identified substantial patterns of individual differences. Together, these general and individual patterns provide fine-grained insights in relationship quality development.

Distress in family relationships often increases as adolescents strive for more autonomy and independence (Laursen & Collins, 2009). So far, research has mainly focused on general patterns of relationship quality development, while individual differences in development received less attention. However, whereas some adolescents might perceive distress in their relationship development, others might not (Arnett, 1999). It could also be that those who perceive distress succeed in restoring the relationship quality with their parents by the end of adolescence, whereas others fail (e.g., Laursen, DeLay, & Adams, 2010). This study provides a comprehensive perspective on changes in parent-adolescent relationship quality by examining both general and individual developmental patterns. For this purpose, a person-centered (i.e., latent transition) approach was applied to a two-cohort five-wave longitudinal study design covering ages 12 to 16 and 16 to 20.

Theoretical Perspectives on Parent-Adolescent Relationship Development

Various theoretical perspectives address change in parent-adolescents relationship quality across adolescence. Within the literature on parent-adolescent relationship development, the *separation-individuation,* the *evolutionary,* the *maturational,* and the *expectancy violation-realignment* perspectives particularly stand out (see review Branje, Laursen, & Collins, 2012). The separation-individuation perspective poses that hormonal changes in puberty are the main force driving adolescents to separate themselves from their parents to become autonomous and independent individuals (Blos, 1967). The evolutionary perspective also emphasizes the role of puberty, and suggests that the distance between adolescents and parents increases as adolescents strive for individuation to find a sexual partner (Steinberg, 1989). The related maturational perspective suggests that adolescents strive to change the unilateral hierarchical relationship with their parents to a more cooperative and egalitarian one as a result of their cognitive development during adolescence (Laursen & Collins, 2009; Youniss & Smollar, 1985). Parents, however, may resist these changes, resulting in more distress in their relationships (i.e., less closeness, more conflicts). Finally, the expectancy violation-realignment perspective relates to previous perspectives by proposing that discrepancies in autonomy expectations lead to disturbances in parent-adolescent relationships, but that these relationships eventually realign or improve by the end of adolescence (Collins & Luebker, 1994).

All four perspectives emphasize the role of independence, equality, and distress in relationship quality development. However, they seem to disagree on how increasing relationship distress would affect relationship quality. Specifically, both separation-individuation and evolutionary perspectives seem to propose that increasing distress in the separation process would eventually cause a wedge between parents and adolescents, but both are silent about potential restoration of relationships in the second half of adolescence. The maturational and realignment perspectives do seem to suggest that

satisfactory relationships can be (re)established by the end of adolescence, as distress is thought to diminish once the relationship is restructured. Thus, despite the evident similarities between the perspectives, there are some discrepancies in terms of the state of the parent-adolescent relationship by the end of adolescence.

Empirical Evidence Concerning Relationship Development

Features of independence, equality, and distress overarch many conceptualizations of parent-adolescent relationship quality (e.g., De Goede, Branje, & Meeus, 2009; Steinberg & Silk, 2002), and are reflected in Furman and Buhrmester's (1985) three-component operationalization of close relationships. These components are *support, negative interaction,* and *power*. Specifically, support refers to nurturance and prosocial behavior, negative interaction includes disagreements and antagonism, and power represents authority versus equality. When examining relationship development as described by the previously discussed theoretical perspectives, the power component relates to processes of independence and equality, whereas both low levels of support and high levels of negative interaction relate to distress.

Several longitudinal studies have examined developmental trends in parent-adolescent relationship quality using the aforementioned key components. For example, De Goede et al. (2009) examined all three key components and showed that across adolescence parental authority diminished, parental support temporarily decreased, and negative interaction temporarily increased. Likewise, other studies have found that parental authority decreased over time, indicating that adolescents perceived more independence from their parents (e.g., Darling, Cumsille, & Martínez, 2008; Loeber et al., 2000). Relatedly, distress in parent-adolescent relationships increased from early to middle adolescence, and decreased thereafter (e.g., Keijsers, Loeber, Branje, & Meeus, 2011; Tsai, Telzer, & Fuligni, 2013; van Wel, 1994). In short, adolescents' increase in their desire for independence and equality toward parents seems to be coupled with a temporary increase in distress (i.e., a reverse U-shape pattern). This implies that relationship quality can be restored by the end of adolescence.

Individual Differences and Constellations of the Key Relational Elements

Although prior studies demonstrated temporary distress in parent-adolescent relationships as adolescents become independent, there is a lack of detailed knowledge on individual differences in these developments using all key relational components. Specifically, most longitudinal studies applied *variable-centered* approaches that focused primarily on single components of relationship development and/or examined general changes that are valid for the entire sample, but neglected heterogeneity in development. Such studies thus largely ignore individual differences in development. This is a limitation because obviously not all individuals will perceive increasing distress in early

adolescence or positively realign the relationship quality with their parents by the end of adolescence. In fact, many studies already have demonstrated that only a subgroup of adolescents perceive increasing distress in their relationship with their parents across adolescence (e.g., Choe, Stoddard, & Zimmerman, 2014; Seiffge-Krenke, Overbeek, & Vermulst, 2010; Skinner & McHale, 2016; Timmons & Margolin, 2015). These studies, however, do not use all of the key components support, negative interaction, and power. Specifically, constellations of relationship components rather than using singular components only would provide a better understanding of the exact quality of a relationship. This is because the interpretation of relationship quality depends on the relational aspects included. For example, the interpretation of a relationship quality with high levels of power would depend on the levels of both support and negative interaction. That is, high power could represent a cooperative authoritarian relationship when combined with high levels of support and low levels of negative interaction; whereas high power may illustrate a destructive hierarchical relationship while combined with low levels of support and high levels of negative interaction. This shows the importance of considering several relationship quality dimensions simultaneously. Thus, we argue that parent-adolescent relationship development should ideally be examined by investigating how development varies across individuals using all key relational components.

A *person-centered approach* can address individual differences in relationship quality and its development using all key relational elements. First, this approach generates constellations of parent-adolescent relationship components *within individuals*. An example of one of these constellations is a harmonious relationship profile in which adolescents perceive high levels of parental support, low levels of conflicts with their parents, and low levels of parental power. Second, this approach allows the examination of *within-individual changes* of relational constellations across consecutive measurement occasions. Consider, for example, that adolescents in a harmonious relationship profile may remain or change into another profile across years (i.e., within-individual changes of component constellations). Using this approach could thus provide detailed insights in both individual differences in relationship quality and individual differences in the development with each relationship quality. We aim to address these two matters using a previously identified relationship typology and analytical procedure that we will describe below.

First, previous research demonstrated within-individual differences in parent-adolescent relationship quality by identifying a relationship typology based on constellations of the key relationship components of Furman and Buhrmester (1985). This research revealed four profiles representing *harmonious* (48% of the sample; high on support, low on negative interaction, and moderate on power), *average* (38%; moderate on support, negative interaction, and power), *turbulent* (9%; low on support, high on negative

interaction and power), and *detached* (5%; low on all components) relationship quality (Hadiwijaya, Klimstra, Vermunt, Branje, & Meeus, 2015). They were replicable and showed distinctive patterns of associations with psychopathology and personality. Importantly, the harmonious, average, and turbulent profiles seemed to represent a substantial proportion of the sample (i.e., more than 5%). Therefore, these three profiles can provide a starting point to examine individual differences in relationship quality development.

Note, however, that we do not regard the aforementioned three profiles as perfect distinct categories, but the use of profiles can be seen as *one way* to explore patterns of individual differences or heterogeneity in relationships. Specifically, profiles are fuzzy because the borders between relationship profiles are not clearly separated (e.g., Asendorpf, Borkenau, Ostendorf, & Van Aken, 2001). In other words, there is an area of classification inaccuracy at the borders between the profiles. Recent procedures, however, are able to adjust for potential inaccuracies and thereby account for such fuzziness (e.g., Vermunt, 2010). Using profiles adjusted for inaccuracy would be a valid approach to examine patterns of individual differences in relationships. However, because the sample specifity of this procedure, we could also identify profiles different from aforementioned obtained profiles when using a different sample.

Second, the use of latent transition analysis (LTA; Vermunt, Tran, & Magidson, 2008) can reveal within-individual differences in adolescents' perceived relationship quality development. This method generates relationship profiles using a set of components, identifies the number of adolescents in various profiles at every measurement occasion, and estimates the extent to which adolescents remain in their profile or change into another (e.g., Vermunt et al., 2008). For instance, it can identify the extent to which adolescents from a harmonious relationship change into an average relationship and the extent to which they change into a turbulent relationship. Thereby, individual differences can be uncovered in the extent to which distress in the parent-adolescent relationship is perceived. Relatedly, it can reveal the extent to which older adolescents change from a turbulent relationship into an average-quality or harmonious relationship, thereby demonstrating individual differences in relationship restorations (i.e., improvements). LTA is therefore ideal for identifying the extent to which adolescents change from a certain relationship (i.e., profile) into another over time, and for examining which particular adolescents perceive distress in the relationship with their parents and achieve satisfactory relationship realignment by the end of adolescence.

The LTA is a crucial procedure to identify individual differences in relationship quality and the developments of these individuals within each relationship quality by using constellations of all relational key components (i.e., support, negative interaction,

and power). Specifically, previous person-centered longitudinal studies (e.g., Choe et al., 2014; Seiffge-Krenke et al., 2010) particularly examined the extent to which adolescents differ in the baseline levels and in the developmental trajectories of a certain relationship aspect across years (i.e., examining support, negative interaction, and/or power separately). Despite the importance of the findings, a singular classification into a relational trajectory provides fewer nuances in developmental differences than a procedure that generates the likelihood of individuals changing into a certain relationship quality for each consequent year. In addition, previous studies lack information about parent-adolescent relationships' quality using all three key components. The use of LTA can overcome both issues by constellating relationship profiles using all three components and examine the extent to which adolescents change from a certain relationship quality profile into another profile from year to year.

The present study will use such a person-centered approach to examine the extent to which parent-adolescent relationship quality development is consistent with the separation-individuation, evolutionary, maturational, and realignment perspectives. We will pursue this goal by using a LTA. First, we aim to examine typical relationship developments by exploring change and stability in the prevalence of relationship quality profiles across the years. Second, we aim to identify the atypical developments by investigating individual patterns that explain the changes in prevalence of profiles (i.e., patterns of adolescents changing from one profile to another).

Study Hypotheses

The four prominent theoretical perspectives predict an (temporary) increase of distress in relationships once individuals enter adolescence. Therefore, we expect an increase in the prevalence of the turbulent relationship profile and a decrease in the prevalence of harmonious and average relationship profiles in early-to-middle adolescence (i.e., ages 12 to 16). Relatedly, we anticipate that early-to-middle adolescents will be relatively more likely to remain in, or change to, a relationship in which they perceive increasing distress and hierarchy (i.e., a turbulent relationship profile).

Furthermore, the maturational and realignment perspectives seem to be relatively similar in proposing an egalitarian and satisfactory relationship establishment by late adolescence, whereas the separation-individuation and evolutionary perspectives are silent about potential relationship restorations. Hence, we expect an increase in the prevalence of both harmonious and average relationships and a decrease in the prevalence of turbulent relationships from middle-to-late adolescence (i.e., age 16 to 20). Thus, we anticipate that middle-to-late adolescents will generally be relatively more likely to remain in, or change to, a relationship with less distress and more equality (i.e., harmonious or average relationship profiles).

Next to these general or typical patterns, we also tentatively expect a considerable proportion of adolescents to exhibit developmental patterns differing from aforementioned typical developmental patterns. We will examine the individual differences and potential atypical patterns in an exploratory manner since no other developmental study has addressed this issue.

Method

Procedure

Data for the current study were collected as part of a longitudinal research project titled Conflict and Management of RElationships in The Netherlands (CONAMORE). The local institutional review board granted approval for this project. Participants were recruited from various high schools in the province of Utrecht, The Netherlands. Both adolescents and their parents received an invitation letter describing the research project and goals. The letter also provided information on how to decline from participation. More than 99% of the approached adolescents signed the informed consent form and thus agreed to participate in the study. Confidentiality of responses was guaranteed to all participants. Adolescents completed the questionnaires at school or at home at the annual measurement waves during which verbal and written instructions were offered. Instructions pertained to reading of the questionnaires, filling out of the answer categories, and time available to complete the various questions. For every wave they participated in, adolescents received a reward of €10 (approximately US$ 11).

Participants

In the present study, we used the first five measurement waves with a one-year interval between each of these waves. Specifically, the additional sixth wave took place four years after the fifth wave. Consequently, including this wave would provide less accurate transitions patterns across years. Therefore, we decided to include these first five consecutive measurement waves only.. The study sample (N = 1,311) was divided into two age groups: an early-to-middle adolescent cohort (n = 919; 49.3% female, M_{age} = 12.4 years, SD = 0.57 at the first measurement wave) and a middle-to-late adolescent cohort (n = 392; 56.7% female, M_{age} = 16.7 years, SD = 0.81 at the first measurement wave). Thus, we use a two-cohort five-wave longitudinal study design covering ages 12 to 16 and 16 to 20.

The early-to-middle adolescent cohort included 467 boys (50.8%) and 452 girls (49.2%), whereas the middle-to-late adolescent cohort consisted of 170 boys (43.4%) and 222 girls (56.6%). At the first measurement wave, the vast majority of adolescents in both age groups reported that they lived with both parents (84.9%). Others reported

living with their mother (7.7%) or elsewhere (e.g., with their father, with their biological parent and stepparent, or with other family members). Most participants identified themselves as Dutch (85.8%); others identified themselves as members of the most common ethnic minorities in The Netherlands (e.g., Surinamese, Antillean, Moroccan, Turkish). Overall, approximately 5.0% of the relationship quality data was missing across waves. Little's (1988) Missing Completely at Random test indicated that these data were likely missing at random ($\chi 2/df = 0.72$; Bollen, 1989). This suggests that adolescents with missing data were similar to those with complete data. For this reason, adolescents with missing data were included in the analyses using maximum likelihood estimation with incomplete data.

Measurements

Relationship quality. Adolescents' relationship quality with their mothers and fathers was measured separately using the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985) (i.e., one NRI for each parent). Specifically, we measured adolescents' perceptions of support received from their mothers and fathers, the intensity of negative interaction they perceived with their mothers and fathers, and the amount of power attributed to their mothers and fathers, separately. Participants were asked to indicate on a 5-point Likert scale (i.e., 1, "A little or not at all", to 5, "More is not possible") the degree to which each of the items described what they perceived. The support scale includes 12 items (e.g., "How much does your mother really care about you?"), the negative interaction scale includes six items (e.g., "Do you and your mother get on each other's nerves?"), and the power scale includes another six items (e.g., "To what extent is your mother the boss in your relationship?").

Internal consistency of all NRI scores was high. Specifically, alphas across waves were ≥.83 for scales referring to the mother-adolescent relationship and alphas ≥ .87 for scales referring to the father-adolescent relationship. We collapsed the scores for adolescent-mother and adolescent-father relationship quality on each component, as our study aimed to identify general parent-adolescent relationship profiles. Principal component analysis showed that the underlying factors represented three relationship components rather than different adolescent-mother or adolescent-father relationship factors (results are available from the first author upon request). Also note that we identified measurement invariance of the NRI scales across age cohorts at the first and fifth measurement wave. This suggests that the NRI scales measure identical constructs in early-to-middle and middle-to-late adolescents. We present these results in Table 1.

Table 1
Measurement Invariance Tests for Early and Late Adolescents' Perceived Relationship Quality with Their Fathers and Mothers

Relationship quality	Wave	Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	BIC
NRI Mother	1	Baseline model	2181.87	540	4.04	0.88	0.87	0.07	68947.99
		Metric invariance	2157.19	522	4.13	0.88	0.87	0.07	69052.31
		Scalar invariance	2386.67	546	4.37	0.86	0.86	0.07	69109.80
NRI Mother	5	Baseline model	2919.35	540	5.41	0.86	0.86	0.08	58966.92
		Metric invariance	2798.96	522	5.36	0.87	0.86	0.08	58974.75
		Scalar invariance	3055.35	546	5.60	0.86	0.86	0.09	59060.17
NRI Father	1	Baseline model	2713.93	540	5.03	0.87	0.87	0.08	67403.85
		Metric invariance	2699.76	522	5.17	0.87	0.86	0.08	67518.09
		Scalar invariance	2923.57	546	5.35	0.86	0.86	0.08	67570.68
NRI Father	5	Baseline model	3635.17	540	6.73	0.85	0.84	0.10	57384.27
		Metric invariance	3500.12	522	6.71	0.85	0.84	0.10	57376.72
		Scalar invariance	3722.56	546	6.82	0.84	0.84	0.10	57429.16

Note. Comparisons of these three models demonstrated measurement invariance for early-to-middle and middle-to-late adolescents at the first and fifth measurement wave. Specifically, the baseline model is without any equality constrains and tests how the three relational constructs (i.e., support, negative interaction, and power) are operationalized for early-to-middle and middle-to-late adolescents. The metric invariance model only constrained the factor loadings to be equal across early-to-middle and middle-to-late adolescent cohort, whereas the intercepts are allowed to differ. This model tests whether early-to-middle and middle-to-late adolescents attribute the same meaning to the latent relationship constructs. The scalar invariance model constrained both the loadings and intercepts of the early-to-middle and middle-to-late adolescents to be equal. This model tests whether the meaning of the relationship constructs are equal in both cohorts. Although there were statistically significant chi-square differences between the models, the differences in CFI and RMSEA values are small (ΔCFI <.010 and ΔRMSEA <.015). Therefore, it is concluded that the NRI measures identical adolescent-mother and adolescent-father relationship constructs in early-to-middle and middle-to-late adolescents.

Data analyses

Main analyses. To answer our research questions, an LTA was performed in Latent GOLD version 5.0 (Vermunt & Magidson, 2013). LTA is a longitudinal extension of latent profile analysis (LPA). LPA aims to identify unobserved classes or profiles of individuals in a population using a set of observed variables at one time point. Individuals are grouped into profiles, of which each contains individuals who are similar to each other and different from those in other profiles (Magidson & Vermunt, 2004).

To examine the extent to which individuals may change from one profile to another profile over time, LPA can be extended to LTA. LTA generates transition probabilities for profile membership over time (e.g., Vermunt et al., 2008). It can thus provide information on (i) the differences in relationships between individuals by producing relationship profiles using configurations of components (i.e., support, negative interaction, and power) and (ii) differences in the within-individual developments by generating transition probabilities between profiles over time.

The current LTA used five-wave data to identify relationship profiles and to provide information about changes in profile prevalence. Additionally, LTA generated estimates of initial classification probabilities and transition probabilities for adolescents moving from one profile to another (e.g., Vermunt et al., 2008). Initial classification probabilities reflect the probability of an adolescent belonging to a certain profile at baseline (i.e., the first wave of the current study). Transition probabilities refer to the probability of an adolescent moving to profile Y on the next measurement wave (e.g., Wave 2) conditional on having been in profile X on the previous wave (i.e., Wave 1).

Furthermore, transition probabilities between profiles may differ by measurement time (e.g., from the first to the second versus the third to the fourth and fifth measurement wave), gender (e.g., boys versus girls), and/or age cohort (i.e., early-to-middle adolescents versus middle-to-late adolescents). Therefore, measurement wave, gender, and cohort were included in the model as moderator variables. To examine potential differences in transition probabilities, we compared the fit of LTA-models with and without these moderator variables and the two-way interactions among these variables (i.e., time by gender, gender by age cohort, and age cohort by time). Specifically, if the LTA-model without any of the moderator variables has the best fit, then transition probabilities of adolescents who remain or change into a certain profile are similar for each measurement wave, gender, and age cohort. However, if the LTA-model with, for example, age cohort has the best fit, then transition probabilities differ for early-to-middle and middle-to-late adolescents.

We used two most commonly used criteria to select the best (and therefore final) latent transition model solution. First, the Bayesian information criterion (BIC; Schwarz, 1978) should be the lowest, as this indicates an improvement in model fit. Second, the profile solution should be theoretically meaningful and parsimonious. That is, additional profiles should make theoretical sense and not be redundant with profiles that were already present in solutions that included fewer profiles (i.e., were more parsimonious). Several additional analyses were also included to clarify the main findings. We describe these analyses throughout the results section.

Results

Parent-Adolescent Relationship Profiles

Latent transition analysis: model selection. In total, we tested seven LTA models: One model without and six models with moderator variables. Models with moderator variables included the variables time (wave 1, 2, 3, 4, or 5), gender (male or female), age cohort (early-to-middle or middle-to-late adolescents), and two-way interactions among these variables (time by gender, gender by age cohort, and age cohort by time). We tested all models for up to six profiles. Only the profile solutions of the model moderated by cohort had lower BIC-values than the profile solutions of the other models for the 2-profile up to the 6-profile solutions. This suggested that the model moderated by cohort had the best fit-parsimony balance and that transition probabilities among profiles were *different* for early-to-middle versus middle-to-late adolescents. Therefore, we continued with the latent transition model moderated by cohort.

Next, we examined the profiles of the latent transition model moderated by cohort to determine the number of latent profiles. Solutions up to six latent profiles led to lower BIC-values, suggesting that each additional profile contributed to model fit improvement. However, when examining these profiles, the five-profile solution appeared to be the most parsimonious and theoretically meaningful. Specifically, the sixth-class of the six-profile solution of the early cohort sample was too small (< 5%), thereby indicating a rare relationship profile for this subsample. The four-profile solution showed a worse model fit than the five-profile solution and missed two unique profiles that the five-profile solution did provide. Therefore, we selected the five-profile solution as the final one.

Figure 1a displays the profiles for the two-profile up to the five-profile solution. As can be seen this figure, the five-profile solution included two unique classes that the four-profile solution did not provide (i.e., class four and five in the five-class solution). However, this solution also included two classes that were already present in the four-

profile solution and that were very similar to each other (i.e., class two and three in the five-class solution). Specifically, these two classes were similar to each other in terms of levels of relationship quality dimension and individual transitions. Keeping these classes separated thus seemed to provide little additional information, as they were relatively identical. For that reason, we decided to merge the fourth and fifth class of the five-profile solution for subsequent analyses in an effort to not lose the unique classes of this solution and to increase model simplicity (Hennig, 2010). Figure 1b displays this integrated five-profile solution. The final model thus represented five profiles integrated into four profiles, with developmental transitions being different for early-to-middle and middle-to-late adolescents.

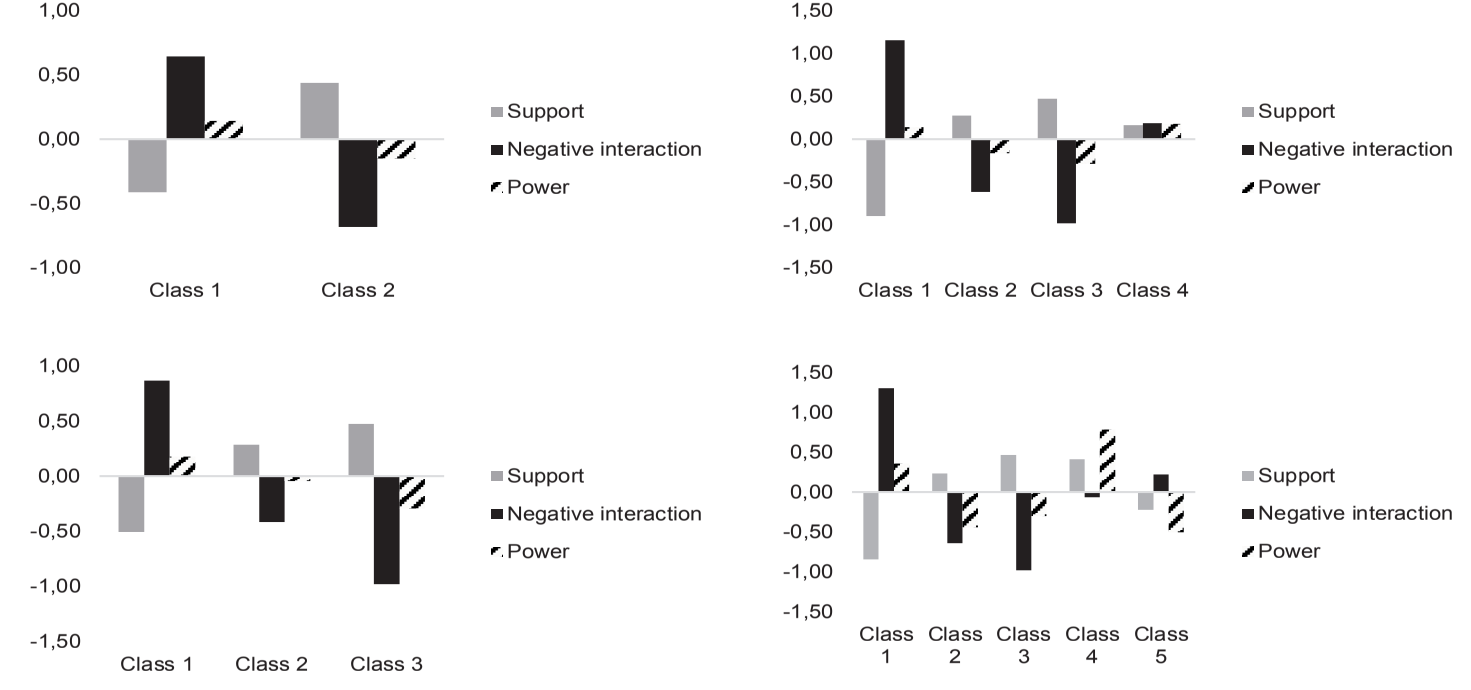

Figure 1a

Parent-adolescent relationship profiles for latent transition solutions up to five classes based on adolescents' perceived parental power, support, and parent–adolescent negative interaction (*N*= 1,311)

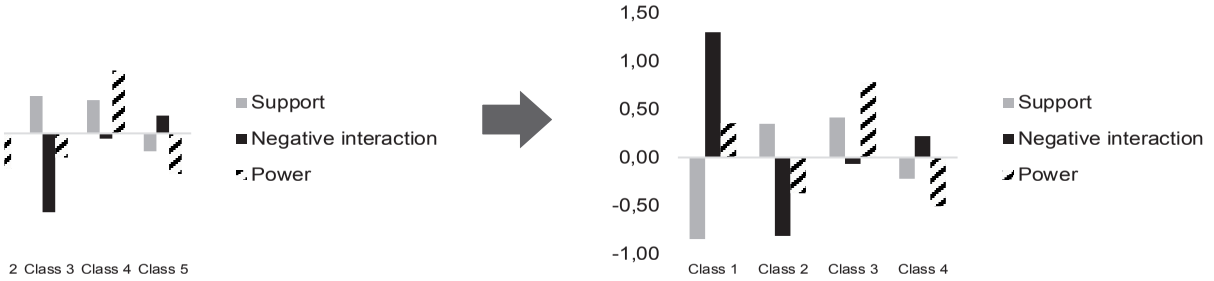

Figure 1b
Integrated four-class solution profiles of parent–adolescent relationships based on adolescents' perceived parental power, support, and parent–adolescent negative interaction (N = 1,311). The means of the integrated profile were calculated using the weighted means of the first and second profiles of the five-class solution

Note that we also obtained similar relationship profiles when examining adolescents' relationship quality with their mothers and fathers, separately. We examined these using the six key relational dimensions of adolescent-mother (i.e., adolescents' reports on support, negative interaction, and power in the relationship with their mother) and adolescent-father (i.e., adolescents' reports on support, negative interaction, and power in the relationship with their father). The LTA five-profile solution based on these six key dimensions revealed five adolescent-mother and adolescent-father profiles that were similar to our current five profiles in which we used the three key dimensions of adolescents-parents (i.e., the collapsed scores of adolescents' reports on support, negative interaction, and power in the relationship with their mother and father). This suggests that merging mother-adolescent and father-adolescent relationship components into a generic parent-adolescent relationship quality leads to similar results as compared to studying mother-adolescent and father-adolescent relationship components separately in our sample using a five-class solution. Figure 1 of the supplemental material illustrates the profiles based on relationship quality dimensions of fathers and mothers, separately.

Latent transition analysis: relationship profiles. We labelled the four parent-adolescent relationship profiles as *turbulent, harmonious, authoritative, and uninvolved-discordant* (displayed in Figure 1b from left to right, respectively). Adolescents in a harmonious relationship (37%) perceived high levels of support and low levels of power and negative interaction. Those who perceive an authoritative relationship (22%) reported high levels of support and power and moderate levels of negative interaction. Adolescents who perceive an uninvolved-discordant relationship (21%) reported low levels of parental support and power and high levels of negative interaction, whereas those who perceive a turbulent relationship (20%) reported particularly low levels of support and high levels of and negative interaction and power.

Next, we conducted an ANOVA to compare the differences in relationship quality between the profiles, while controlling for classification inaccuracy of the relationship profiles using a three-step procedure. For more information about this three-step procedure, please see Vermunt (2010). Table 2a illustrates the mean scores of individuals classified in the four relationship profiles on support, negative interaction, and power. This table shows that means on the three relationship quality dimensions were significantly different for all profiles. This table also displays the number of adolescents in each of the profiles. Moreover, we performed additional analysis on these profiles to examine whether parents and adolescents perceived the quality of their mutual relationship similarly. Hereby, we used the data of a subgroup of the parents (N = 308) from the early-to-middle adolescent cohort. Specifically, only these parents (and not those of the other 1,003 participants) reported the extent to which they provided support and expressed power to their children. For this purpose, they filled out the Network of Relationships

Inventory (Furman & Buhrmester, 1985) at the second measurement wave only. Using these data, we examined whether parental levels of support and power significantly differed across each of the four relationship profiles as reported by adolescents. Table 2b show these results. It seemed that these profiles do not significantly differ on relationship quality as perceived by adolescents' parents. For instance, parents from adolescents in a harmonious relationship perceived a similar relationship quality when compared to parents whose adolescent children perceived an authoritative, uninvolved-discordant, or turbulent relationship. This suggests that parents and adolescents perceived their relationships differently since they do not report distinct relationship quality patterns as their adolescent children do. Therefore, it should be kept in mind that our findings reflect adolescent perceptions of the relationship with their parents.

Table 2a
Three-step ANOVA Total Sample Mean Comparisons of Relationship Types at the First Wave

Relationship quality	Harmonious (n =486) *M (SD)*	Authoritative (n = 285) *M* (*SD*)	Uninvolved-discordant (n = 277) *M* (*SD*)	Turbulent (n = 263) *M* (*SD*)	Total (N = 1,311) *M (SD)*	Wald value
Support	3.64 (0.61)[a]	3.70 (0.44)[b]	3.27 (0.50)[c]	2.87 (0.70)[d]	3.45 (0.64)	1815.08*
Negative interaction	1.08 (0.10)[a]	1.45 (0.26)[b]	1.58 (0.25)[c]	2.14 (0.66)[d]	1.48 (0.50)	534.68*
Power	2.41 (0.65)[a]	3.02 (0.50)[b]	2.14 (0.38)[c]	2.62 (0.75)[d]	2.56 (0.67)	350.62*

Note. *p <.001. Different superscripts represents significant mean-levels differences between relationship profiles. Profiles with different superscripts across rows differ from one another with regard to relationship quality. Post-hoc tests were Bonferroni corrected with α = 0.004, in which we divided the usual critical p-value of .05 in a two-tailed test by six (i.e., the total number of profile comparisons). Comparisons of classes on relationship quality were controlled for gender and age. For these comparisons, we used the total sample of adolescents (N = 1,311).

Table 2b

Non-significant Differences in Perceived Relationship Quality by Mothers and Fathers at the Second Measurement Wave

		Harmonious	Authoritative	Uninvolved-discordant	Turbulent	Total	
Relationship quality		(*n* = 140)	(*n* = 57)	(*n* = 49)	(*n* = 62)	(*N* = 308)	Wald value
		M (SD)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M (SD)*	
Mother report on adolescent							
	Support	3.36 (0.40)[a]	3.46 (0.42)[a]	3.31 (0.37)[a]	3.32 (0.43)[a]	3.36 (0.41)	6.03
	Power	1.54 (0.33)[a]	1.57 (0.40)[a]	1.54 (0.39)[a]	1.62 (0.44)[a]	1.56 (0.38)	1.63
Father report on adolescent							
	Support	3.23 (0.45)[a]	3.23 (0.40)[a]	3.15 (0.43)[ab]	3.08 (0.48)[bc]	3.19 (0.45)	6.79
	Power	1.67 (0.39)[a]	1.71 (0.39)[a]	1.67 (0.35)[a]	1.72 (0.38)[a]	1.69 (0.38)	1.21

Note. Different superscripts represents significant mean-levels differences between samples. Samples with different superscripts across rows differ from one another with regard to relationship quality. Post-hoc tests were Bonferroni corrected with $\alpha = 0.004$, in which we divided the usual critical *p*-value of .05 in a two-tailed test by six (i.e., the total number of profile comparisons). Comparisons of classes on relationship quality were controlled for gender and age. Please note that there was only limited data on paternal and maternal reports of the relationship quality with their children. That is, such data was only available for 23% of our total sample, on one measurement occasion, and on two out of three relational components.

Stability and Change in Relationship Development

We performed an omnibus test using a logistic regression analysis to examine the overall changes across time in profile prevalence (with time as predictor and profile as outcome). Hereby, we also controlled for classification inaccuracy by using a three-step procedure (e.g., Vermunt, 2010). The test revealed significant overall changes in profile prevalence during early-to-middle and middle-to-late adolescence separately (Wald-value= 119.76, p <.05 for the early cohort and Wald-value= 106.53, p <.05 for the late cohort). Figure 2 presents these prevalence patterns across waves. To follow up on the omnibus test, we also performed post-hoc tests by calculating the z-values and confidence levels of each profile in each wave to examine the differences in prevalence rates between waves and cohorts. Table 3 displays the prevalence of each profile in each wave and indicates whether the prevalence differed significantly between and within the cohorts.

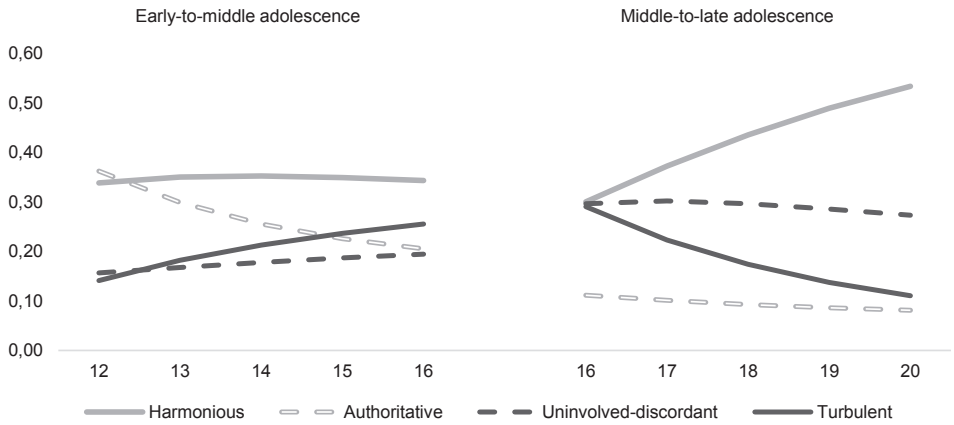

Figure 2

Parent-adolescent relationship percentage rates of early-to-middle (n = 919) and middle-to-late (n = 392) adolescents across five years

Table 3
Size of Parent-Adolescent Relationship Profiles for Early-to-Middle and Middle-to-Late Adolescents Across Five Waves

	Harmonious		Authoritative		Uninvolved-discordant		Turbulent	
Wave	*n*	%	*n*	%	*n*	%	*n*	%
				Early-to-middle adolescents (*n* = 919)				
1	311	0.34[a]	333	0.36*[a]	144	0.16*[a]	130	0.14*[a]
2	322	0.35[a]	275	0.30*[ab]	154	0.17*[a]	167	0.18[ab]
3	324	0.35*[a]	235	0.26*[b]	164	0.18*[a]	196	0.21[ab]
4	321	0.35*[a]	208	0.23*[b]	172	0.19*[a]	218	0.24*[b]
5	316	0.34*[a]	189	0.21*[b]	179	0.19[a]	235	0.26*[b]
				Middle-to-late adolescents (*n* = 392)				
1	118	0.30[a]	44	0.11*[a]	116	0.30*[a]	114	0.29*[a]
2	146	0.37[ab]	40	0.10*[a]	119	0.30*[a]	88	0.22[ab]
3	171	0.44*[bc]	36	0.09*[a]	116	0.30*[a]	68	0.17[ab]
4	192	0.49*[bcd]	34	0.09*[a]	112	0.29*[a]	54	0.14*[b]
5	209	0.53*[cd]	32	0.08*[a]	107	0.27[a]	43	0.11*[b]

Note. All post hoc-analyses were Bonferroni corrected (α = 0.001). Asterisks based on the estimations of *z*-values indicate significant differences in prevalence among similar waves *between* the cohorts. Hereby, *z*-values below -3.023 and above 3.023 indicate that the differences are below the *p*-value of .05 in a two-tailed test. Prevalence rates sharing the same superscript(s) among the waves are not significantly different from each other *within* the cohorts. This was tested using a confidence level of 99.75% in which non-overlapping confidence intervals indicate significant differences in prevalence rates among the waves.

Our results indicated that a harmonious relationship was the most common throughout adolescence (rates between 30% and 53%). In addition, both uninvolved-discordant and turbulent relationships were relatively common throughout adolescence (rates between 16% and 30% and between 11% and 29%, respectively). The authoritative relationship was also relatively common during early-to-middle adolescence (rates between 21% and 36%), but less common during middle-to-late adolescence (rates between 8% and 11%).

The overall prevalence of each profile differed significantly between the cohorts. Specifically, there were significantly higher rates of turbulent and authoritative relationships and significantly lower rates of harmonious and uninvolved-discordant relationships in early adolescence than in late adolescence. We also identified within-cohort differences in prevalence among the waves. During the early-to-middle adolescent cohort, the prevalence of turbulent relationships significantly increased and the prevalence of authoritative relationships significantly decreased. Furthermore, in the middle-to-late adolescent cohort the prevalence of harmonious relationships significantly increased whereas the prevalence of turbulent relationships significantly decreased. However, no significant changes emerged in the prevalence of a harmonious relationship during early-to-middle adolescent cohort and in the prevalence of the uninvolved-discordant profile throughout adolescence.

Individual Differences in Development

In the present study, we particularly focused on the transitions across 4-years as they illustrate long-term relationship developments. Table 4 display the transition probabilities of parent-adolescent relationship profiles for early-to-middle and middle-to-late adolescents across a 4-year interval. However, we also provide transition probabilities across a 1-year interval (i.e., short-term developments) in Table 1 of the supplemental material. An important difference is that there was less relationship stability across a 4-year interval when compared to the 1-year interval. Other than that, the most common transition patterns across 1-year and 4-year were relatively similar to each other. In addition, we examined differences in transitions within the profiles and between the cohorts. In the next sections, we describe the transition patterns of adolescents' perceived relationship quality with their parents that can explain the change and stability in aforementioned relationship quality prevalence patterns.

Early-to-middle adolescence. We revealed transition patterns that may explain the decrease in authoritative relationships during early-to-middle adolescence and the low prevalence of this relationship in middle-to-late adolescence. Additionally, we identified transition patterns that explain the increase in turbulent relationships during early-to-middle adolescence.

Adolescents in an authoritative relationship were unlikely to remain in this relationship as such (only 35% did). Most of those in authoritative relationships changed into a different relationship profile. Specifically, 31% changed into a harmonious relationship, 23% changed into a turbulent relationship, and 11% changed into an uninvolved-discordant relationship profile. Individuals in other relationships were unlikely to change to an authoritative relationship (rates between 6% - 15%). However, they were still significantly more likely to do so in early-to-middle adolescent cohort when compared to middle-to-late adolescent cohort (rates between 2% - 6%).

Adolescents in a turbulent relationship showed high probabilities to remain in this relationship (i.e., 63%). In addition, 13% to 23% of adolescents in other relationship profiles were likely to change into a turbulent relationship profile. At the same time, those in a turbulent relationship profile were unlikely to change into other relationship profiles (10% - 14%).

Middle-to-late adolescence. We identified transitions that seem to underlie the significant decrease in turbulent relationships and the significant increase of harmonious relationships in middle-to-late adolescence.

Those in a turbulent relationship showed low levels of relationship stability (i.e., 32%). Of those who changed, 36% of adolescents in a turbulent relationship profile changed into an uninvolved-discordant and 26% of these adolescents shifted to a harmonious relationship. Additionally, adolescents in one of the other relationships were very unlikely to shift into a turbulent relationship (rates between 2% - 3%). These stability and transition estimates were significantly lower during the middle-to-late adolescent cohort than during the early-to-middle adolescent cohort.

Adolescents in a harmonious relationship were likely to remain in this relationship (i.e., 78%). Of those who changed, 15% changed into an uninvolved-discordant relationship and only 2% to 5% of these adolescents shifted into an authoritative or turbulent relationship. Moreover, adolescents in other relationship profiles were likely to shift to the harmonious relationship profile (rates between 26% - 55%). The high stability of and transitions into a harmonious relationship were significantly higher in the middle-to-late adolescent cohort than in the early-to-middle adolescent cohort.

Transitions explaining the non-significant prevalence changes. Finally, we describe transition patterns that may explain the non-significant changes in the prevalence of harmonious relationships during early-to-middle adolescence and the prevalence of uninvolved-discordant relationships during middle-to-late adolescence. Although adolescents in a harmonious relationship profile were likely to change into one of the other

relationship profiles during early-to-middle adolescence (rates between 13% - 19%), those in an authoritative (i.e., 31%) or uninvolved-discordant (i.e., 27%) relationship were also very likely to change into a harmonious relationship profile. During early-to-middle adolescence, 27% of those classified in an uninvolved-discordant relationship profile changed into a harmonious relationship profile and 22% changed into a turbulent relationship profile. However, adolescents of the other three profiles were also likely to shift into an uninvolved-discordant relationship (rates between 11% - 19%). During middle-to-late adolescence, those in the other relationship profiles remained likely to shift into an uninvolved-discordant relationship (rates between 15% - 36%), whereas 55% of the adolescents in an uninvolved-discordant relationship mainly changed into a harmonious relationship. In short, the balance between relationship profile shifts in and out of profiles seemed to explain the non-significant change in the prevalence rates.

Table 4
Transition Probabilities of Parent-Adolescent Relationship Change Across 4-Year Interval for Young and Old Cohort

	Transition probabilities for parent-adolescent relationship type in year N+4			
Relationship type in year N	H	A	U	T
	Early-to-middle adolescents (N = 919)			
Harmonious (H)	0.52*^{a}	0.15*^{b}	0.19^{b}	0.13*^{b}
Authoritative (A)	0.31^{a}	0.35^{a}	0.11^{b}	0.23*^{ab}
Uninvolved-discordant (U)	0.27*^{a}	0.06*^{b}	0.45^{ac}	0.22*^{a}
Turbulent (T)	0.10*^{a}	0.14*^{a}	0.13*^{a}	0.63*^{b}
	Middle-to-late adolescents (N = 392)			
Harmonious (H)	0.78*^{a}	0.05*^{b}	0.15^{bc}	0.02*^{b}
Authoritative (A)	0.53^{a}	0.38^{ab}	0.08^{bc}	0.02*^{c}
Uninvolved-discordant (U)	0.55*^{a}	0.02*^{b}	0.39^{a}	0.03*^{b}
Turbulent (T)	0.26*^{a}	0.06*^{b}	0.36*^{a}	0.32*^{a}

Note. All post hoc-analyses were Bonferroni corrected (α = 0.002). Asterisks based on the estimations of z-values indicate significant differences in transition probabilities among the profiles *between* the cohorts. Hereby, z-values below -2.955 and above 2.955 indicate that the differences are below the p-value of .05 in a two-tailed test. In addition, transitions sharing the same superscript(s) in rows are not significantly different from each other *within* the cohorts. This was tested using a confidence level of 99.58% in which non-overlapping confidence intervals indicate significant differences in transition probabilities among the profiles.

Discussion

This study provides the first longitudinal person-centered investigation of the extent to which parent-adolescent relationship quality development is consistent with the separation-individuation, evolutionary, maturational, and realignment perspectives. Although prior person-centered research revealed meaningful individual difference in patterns of relationship development, these studies (Choe et al., 2014; Seiffge-Krenke et al., 2010) lack information using all the key components support, negative interaction, and power, and the extent to which adolescents remain or change from a particular relationship quality profile into another across years. Our study addresses these limitations by applying a LTA procedure using a two-cohort large-scale longitudinal dataset (N = 1,311) with five annual waves to examine how adolescents' perceived relationship quality with their parents changed across years. Findings suggest that from ages 12 to 16 years only a subgroup of adolescents moved away from perceiving an authoritative relationship with their parents or changed into an uninvolved-discordant or turbulent relationship. Interestingly, some continued to perceive an authoritative relationship and many changed into perceiving a harmonious relationship with their parents. From ages 16 to 20 years, a majority of adolescents changed the relationship with their parents into a harmonious one. However, some continued to perceive the relationship with their parents as uninvolved-discordant or turbulent.

Together, our results seem to partly provide support for the maturational and realignment perspectives in terms of adolescents' perceived relationship development with their parents. Specifically, partly in line with these perspectives, we found evidence that only some adolescents temporarily perceive distress in the relationship with their parents as their relationship evolves from hierarchical into egalitarian. Moreover, we found substantial individual differences indicating that some adolescents do not experience relationship quality development in a way that would be proposed by theoretical notions. Our promising findings shed light on the importance of studying individual differences in relationship development across adolescence. We discuss these findings below.

Parent-Adolescent Relationship Profiles

Using the key components power, support, and negative interaction, we identified *harmonious, authoritative, uninvolved-discordant,* and *turbulent* parent-adolescent relationship profiles[1] that only partly overlapped with a prior relationship typology (Hadiwijaya et al., 2015). Similar to this typology, we obtained and replicated the

1 Please note that despite the arbitrariness of our profile labels, our profiles do reflect relative tendencies of people classified in these profiles. For example, adolescents in a turbulent relationship are relatively more likely to perceive "turbulence" (i.e., low levels of support and high levels of negative interaction and power) in the relationship with their parents than those in the other relationships.

harmonious and turbulent relationship profiles. Unlike the prior typology, we did not obtain or replicate the average relationship profile, but identified two additional profiles (i.e., authoritative and uninvolved-discordant). Specifically, the previously uncovered average relationship seems to be divided into an authoritative and uninvolved-discordant relationship profile. This may be due to slightly different patterns of heterogeneity in our sample related to including a more extensive age range (ages 12 *to* 20 year-olds) when compared to the sample that was assessed in previous research (12-years *and* 16-year-olds). The specific profiles that we identified thus seem to be slightly different depending on the sample we examined. Nevertheless, we found substantial replication of these profiles and we argue that the use of profiles is important as it represents *one way* to identify individual differences in relationships while taking account of the *multidimensional nature* of relationships (i.e., constellations of key relational dimensions).

Development of Parent-Adolescent Relationships Across Adolescence

From ages 12 to 16 years, two important *global* changes emerged. First, there was a steep decline in adolescents' perceiving authoritative relationships. Specifically, a subgroup of adolescents who perceive an authoritative relationship with their parents were very likely to change to one of the other relationship profiles. This indicates that substantial numbers of the early adolescents moved away from relationships in which perceived support from parents was coupled with perceived parental authority. These findings are also consistent with literature demonstrating that the sharpest decrease in the endorsement of parental authority occurs during early adolescence (e.g., Darling et al., 2008). Second, the prevalence of adolescents' perceiving turbulent relationships increased. Adolescents in turbulent relationships with their parents typically remained to perceive this relationship, whereas those in one of the other relationship qualities were likely to change to this relationship type. This suggests that a subgroup of the early adolescents moved toward perceiving a poorer relationship, as they seemed to question the authority enforced by their parents.

Overall, these findings are partly consistent with studies showing that parent-adolescent relationship quality worsened in early adolescence (e.g., De Goede et al., 2009; Keijsers et al., 2011; Tsai et al., 2013). The fact that some adolescents move away from perceiving authoritative relationships and that some change into turbulent relationships thus lends partial support to the separation-individuation, evolutionary, maturational, and realignment perspectives, as these theories all propose that early adolescence is a period in which adolescents generally strive for more independence and distress increases in the relationship with parents.

Additionally, we detected individual differences in relationship quality development that deviate from the aforementioned global patterns of development and theoretical notions.

First, *more than one-third* of those perceiving an authoritative relationship continued to perceive the relationship like this. This suggests that a substantial proportion of adolescents does remain to perceive a relationship in which they experience parental support and endorse parental authority. Thus, although most adolescents perceived themselves striving for more independence and grew less likely to legitimate parental authority, some adolescents perceive themselves as accepting their parents authority to set rules in certain areas of their lives (Darling et al., 2008). Individual differences in the *belief of endorsing parental authority* may explain why some adolescents remained in an authoritative relationship, whereas others moved away from it. This, however, is not necessarily alarming as those who endorse parental authority in a supportive relationship seem to be more likely to voluntarily disclose information to their parents (e.g., Darling, Cumsille, Caldwell, & Dowdy, 2006). Parental disclosure, in turn, seems to be linked to positive outcomes during adolescence (e.g., Keijsers, Frijns, Branje, & Meeus, 2009).

Second, our findings show that *many adolescents* experience improvements instead of difficulties in the relationship with their parents. Specifically, about half (52%) of the adolescents who perceived a harmonious relationship at the beginning of the study remained to perceive a harmonious relationship with their parents. Many others who were initially not classified in a harmonious relationship profile even changed into a harmonious relationship profile (rates between 10% - 31%). These findings seem to be in line with a previous meta-analysis which indicated that parent-adolescent conflicts generally decreases across years (Laursen, Coy, & Collins, 1998). Furthermore, our findings relate to the *modified storm-and-stress* perspective (Arnett, 1999), which specifies that only a subgroup perceive difficulties during adolescence. They are also in line with studies demonstrating that only some perceive distress in the relationship with their parents (e.g., Choe et al., 2014; Seiffge-Krenke et al., 2010; Skinner & McHale, 2016; Timmons & Margolin, 2015), perceive mood disruptions (Dekker et al., 2007), and engage in risk behavior (e.g., Marti, Stice, & Springer, 2010). It seems that only some adolescents perceive trouble in the relationship with parents while many others do not.

From ages 16 to 20 years, we identified three important *global* findings. First, there was an increasing prevalence of adolescents perceiving a harmonious relationship with their parents. Specifically, adolescents in a harmonious relationship typically remained in this relationship and if those in other relationship profiles changed, they most often changed into this relationship. Second, those who perceived turbulent relationships became less common. Adolescents in a turbulent relationship mostly changed into another relationship type, whereas changes into the turbulent profile were uncommon. Third, adolescents perceiving authoritative relationships remained uncommon in late adolescence. Overall, these findings show that an increasing number of adolescents changed into a relationship in which they perceived support and equality with their

parents, whereas a decreasing number of adolescents moved into a relationship in which they perceived conflicts and/or endorsed parental authority. This implies that many adolescents' perceive restorations or improvements in the relationship quality with their parents by the end of adolescence. Our results seem to be consistent with previous work showing that late adolescents were less likely to legitimate parental authority (e.g., Darling et al., 2008) and that parent-adolescent relationship quality improves by late adolescence (e.g., De Goede et al., 2009; van Wel, 1994). The change of many, but not all, adolescents into a harmonious relationship thus seem to relate partly to the maturational and the realignment perspectives, which propose that hierarchical and/or perturbed parent-adolescent relationships generally become egalitarian and supportive.

Furthermore, we also identified individual differences in development in late adolescence that deviate from the theoretical perspectives. A striking example of this is that *not all adolescents* changed to perceive a harmonious relationship with their parents. In fact, more than one-third of the adolescents continued to perceive an uninvolved-discordant or in a turbulent relationship. A substantial subgroup of adolescents thus seems to fail in establishing a satisfactory relationship quality with their parents. This is worrisome, also because of the so-called *cross-relationship continuity* phenomenon (Seiffge-Krenke et al., 2010). This phenomenon entails a long-lasting effect in which adolescents in hostile family environments are susceptible for developing poor quality romantic relationships (e.g., Ehrensaft et al., 2003). Practitioners should bear this in mind when working with late adolescents who perceive a hostile relationship with their parents. Additionally, future studies could examine the extent to which this hostility transfers to other relationships. Note, however, that most adolescents did perceive a satisfactory relationship with their parents by the end of adolescence. This suggests that many may come to experience the cross-relationship continuity phenomenon in a positive way.

Importantly, we also identified considerable relationship stability next to the aforementioned changes. Specifically, 35% to 63% of early adolescents and 32% to 78% of late adolescents across all relationship profiles remained to perceive their current profile. This implies that *a substantial number* of adolescents experienced no changes in the relationship quality with their parents across the years. These findings seem to be in contrast to the four perspectives that all assume change in parent-adolescent relationship quality in terms of increasing distress and independence. However, they add to previous literature by indicating not only that some abusive or neglective parent-adolescent relationships (i.e., turbulent, uninvolved-discordant) remain unchanged (e.g., Laursen & Collins, 2009), but also that some emotionally close relationships could remain stable as well (i.e., harmonious, authoritative).

In sum, with two cohorts that together covered ages 12 to 20 years, we identified a reverse U-shape pattern of parent-adolescent relationship development in which some adolescents perceived distress in the relationship with their parents to increase and then to decrease as the relationship with their parents changed from hierarchical to egalitarian. These findings are partly in line with the findings of De Goede et al. (2009). However, we also extend their findings by demonstrating individual differences in relationship development while taking the several relationship quality dimensions into account simultaneously. Furthermore, because some of our findings indicate temporary deteriorations in parent-adolescent relationships, they can be linked to the reverse U-shape pattern found in adolescence in terms of delinquency tendencies (e.g., Moffitt, 1993) and aggression (e.g., Meeus, Schoot, Hawk, Hale, & Branje, 2016). In addition, they relate to the U-shape pattern found in adolescence with respect to moral judgment (e.g., Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005) and empathic perspective taking (e.g., Van der Graaff et al., 2014). However, due to the identification of substantial individual differences, it should be kept in mind that only some adolescents experience their social developments to first deteriorate and then restore later again as they become independent.

Associations with Multifinality and Equality Concepts

Individual transition patterns shed light on the *multifinality* and *equifinality* concepts of developmental pathways (e.g., Cicchetti & Rogosch, 2002). Specifically, multifinality entails that any starting point evolves in diverse final states, whereas equifinality suggests that different starting points develop into one final state.

During early to middle adolescence, we mainly found evidence for multifinality. Although the overall prevalence rates indicate that adolescents systematically perceived a turbulent relationship or moved away from perceiving an authoritative relationship in this period, only a subgroup (13% to 23% of early adolescents) changed to perceive a turbulent relationship or moved away from perceiving an authoritative relationship (65%). In addition, early adolescents were also likely to change into an authoritative or turbulent relationship, next to changing into perceiving a turbulent or harmonious relationship, than late adolescents were. This suggests that early adolescents showed no evident trend toward changing into one specific profile and that they generally changed into one of the four profiles. Early adolescence thus seems to reflect a period in which increased variations in transitions of perceived relationship quality occur.

During middle to late adolescence, we found evidence for both multifinality and equifinality. Multifinality emerged especially for those in a turbulent relationship. These adolescents either succeeded in changing into a harmonious relationship or failed and changed into an uninvolved-discordant relationship. The latter is important as

it suggests that those in turbulent relationships may fail in establishing an egalitarian relationship with their parents that is satisfactory. This finding seems to be highly in line with the *autonomy-relatedness* model (Grotevant & Cooper, 1986), which states that adolescents' independence is best achieved in the context of close relationships. Particularly adolescents perceiving a turbulent relationship may therefore perceive difficulties in establishing an independent and satisfactory relationship with their parents because of the disruptions in their relationship. Moreover, equifinality emerged in those perceiving a harmonious, authoritative, or uninvolved-discordant relationship. Adolescents perceiving one of these three relationship qualities were all likely to perceive a harmonious relationship by late adolescence. A harmonious relationship therefore appears to serve as an *endpoint* of relationship formation, indicating that adolescents typically move to perceive an egalitarian and satisfactory relationship by late adolescence (Collins & Luebker, 1994; Youniss & Smollar, 1985).

Limitations and Suggestions for Future Studies

One major shortcoming of the present study is the use of a single, self-report measure to examine parent-adolescent relationship quality development. We only provided *perceptions* of adolescents' relationship developments and lack of information about parental experiences. On the other hand, because relationship quality is mostly in the "eye of the beholder" (e.g., Branje, van Aken, & van Lieshout, 2002), it is adolescents' relationship experiences that are crucial in predicting their developmental outcomes (e.g., well-being, self-esteem, academic achievements). Nevertheless, future research should examine whether parents perceive similar patterns of relationship quality development, or investigate how perception similarities and discrepancies in relationship quality evolve throughout adolescence, and affect adolescent and parental adjustment.

Another drawback is that the present study is that *reasons for the observed changes* remained unexamined. For example, it remains unclear why some adolescents perceive a poor relationship during early adolescence, whereas others do not. For example, those who experience more depressive symptoms may be more likely to perceive a poor relationship and would be less likely to change into a satisfactory relationship across years when compared to those experiencing less depressive symptoms (e.g., Branje, Hale, Frijns, & Meeus, 2010). Future studies should examine variables that may affect differences in relationship quality development.

Moreover, the present research covered the period of adolescence using a *two-cohort five-wave longitudinal study design* (i.e., 12 – 16 years and 16 – 20 years) rather than following the same adolescents from ages 12 to 20. Although early-to-middle adolescents at T5 (i.e., average age of 16 years) showed a small difference in their levels of support, negative interaction, and power from middle-to-late adolescents at T1 (i.e., average age of 16

years) both cohorts are quite comparable for two reasons. Firstly, we found the same relationship profiles in both cohorts. Secondly, developmental patterns of mean level change of relationship dimensions were very consistent across both cohorts. Specifically, the decrease in relationship quality reaches its peak in middle-adolescence. That is, the lowest level of relationship quality was found in waves 4 and 5 of the early cohort and in waves 1 and 2 of the late cohort. Similarly, parental power decreased regularly across cohorts, with the smallest differences in power between the fifth wave of the early cohort and the first wave of the late cohort. This consistency across cohorts in mean level change of relationship dimensions is also nicely visible in the prevalence patterns of the relationship types shown in Figure 2. Thus, we observe systematic developmental trends across both cohorts for each of the four relationship types. Data of mean-level change of the three relationship dimensions can be obtained from the first author.

Finally, examining early-to-middle and middle-to-late adolescence only offers a limited understanding of the timing on relationship quality change and stability patterns that can reach far back into childhood or reach further into adulthood. For instance, those who remained in a harmonious relationship across years may already have had a turbulent phase with their parents in the childhood period. Additionally, those who were in an uninvolved-discordant or in a turbulent relationship by the end of adolescence may just postpone the reestablishment of a satisfactory relationship with their parents into the adulthood (e.g., adolescents who left their parental home) (e.g., Seiffge-Krenke, 2013). Future studies should examine relationship quality development covering both childhood and adulthood using one cohort.

Conclusions

Our study is the first to simultaneously test the separation-individuation, evolutionary, maturational, and realignment perspectives and to demonstrate both typical and atypical individual patterns in adolescents' perceived relationship quality development by applying a person-centered approach. This is a major contribution since prior studies were mainly variable-centered, included a singular relational aspect, and focused on a general pattern of relationship development only. Although prior person-centered studies revealed meaningful individual relationship trajectories, they lacked information about parent-adolescent relationship quality using all the key components support, negative interaction, and power, and the extent to which adolescents remain or change from a particular relationship status into another across years (Choe et al., 2014; Seiffge-Krenke et al., 2010). Our study has now addressed these shortcomings by applying LTA. We believe that the use of LTA is important as it can provide individual development in detail while taking account of the multidimensional nature of relational concepts. Using

this procedure, we demonstrated the need to recognize that although adolescents engage in similar normative developmental tasks (i.e., strive for independence); there are also relationship changes unique to particular parent-adolescent relationship qualities. Our promising findings mark the need for studying individual differences in relationship development across adolescence.

Our study provides new and unique evidence for adolescence being far less intense than presumed, as only a minority of adolescents experienced distress in the relationship with their parents. Importantly, we showed that only some adolescents continued to perceive themselves as dependent upon their parents and that only some ended to perceive a deteriorated relationship. Many adolescents, however, successfully grew to perceive themselves as independent individuals and simultaneously established a satisfactory relationship by the end of adolescence despite the distress that emerged. Thus, only some adolescents experience their independence to bloom after a temporary period of storm-and-stress with their parents.

Supplementary material

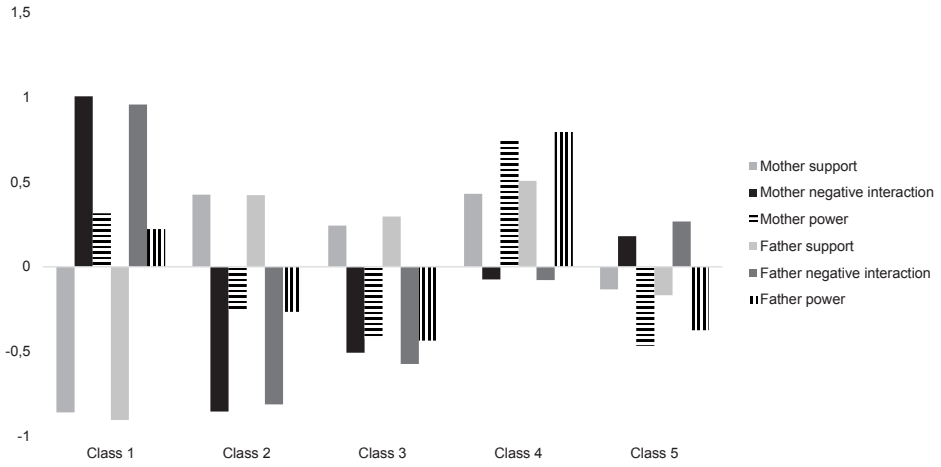

Figure 1
Parent-adolescent relationship profiles for a five-class latent transition solution based on adolescents' perceived support, negative interaction, and power in the relationship with their mothers and fathers (*N*= 1,311)

Table 1
Transition Probabilities of Parent-Adolescent Relationship Change Across 1-Year Interval for Young and Old Cohort

	Transition probabilities for parent-adolescent relationship type in year N+1			
Relationship type in year N	H	A	U	T
	Early-to-middle adolescents (N = 919)			
Harmonious (H)	0.81*[a]	0.08*[b]	0.08[b]	0.03[b]
Authoritative (A)	0.15[a]	0.73[b]	0.03[c]	0.10*[a]
Uninvolved-discordant (U)	0.12*[a]	0.00[b]	0.79[c]	0.09*[a]
Turbulent (T)	0.01[a]	0.06[a]	0.05*[a]	0.87*[b]
	Middle-to-late adolescents (N = 392)			
Harmonious (H)	0.91*[a]	0.02*[b]	0.06[b]	0.01[b]
Authoritative (A)	0.21[a]	0.77[b]	0.01[c]	0.01*[c]
Uninvolved-discordant (U)	0.23*[a]	0.00[b]	0.75[c]	0.02*[b]
Turbulent (T)	0.03[a]	0.03[a]	0.20*[b]	0.74*[c]

Note. All post hoc-analyses were Bonferroni corrected (α = 0.002). Asterisks based on the estimations of *z*-values indicate significant differences in transition probabilities among the profiles *between* the cohorts. Hereby, *z*-values below -2.955 and above 2.955 indicate that the differences are below the *p*-value of .05 in a two-tailed test. In addition, transitions sharing the same superscript(s) in rows are not significantly different from each other *within* the cohorts. This was tested using a confidence level of 99.58% in which non-overlapping confidence intervals indicate significant differences in transition probabilities among the profiles.

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Chapter 4

Relationship Development in Anxious and Non-Anxious Adolescents

Hadiwijaya, H., Klimstra, T.A., Vermunt, J.K., Branje, S.J.T., & Meeus, W.H.J. (in press). Perceived Relationship Development in Anxious and Non-Anxious Adolescents: A Person-Centered Five-Wave Longitudinal Study.

Journal of Child Abnormal Psychology

Abstract

Developmental changes in adolescents' relationships with parents and friends intertwine, but individual differences in these relationships are likely to emerge as not all adolescents develop similarly. Generalized anxiety symptoms may underlie these individual differences, as these symptoms have frequently been associated with interpersonal difficulties. This study examines relationship quality development with parents and friends in adolescents with low and high levels of generalized anxiety symptoms. A latent transition analysis was performed in a two-cohort five-wave study design covering ages 12 to 16 (n = 923, 50.8% males) and 16 to 20 (n = 390, 43.4% males). About one-third of adolescents with high levels of generalized anxiety symptoms perceived a turbulent relationship with both their parents and best friends, whereas only one-tenth of those with low levels of generalized anxiety symptoms did. Low levels as opposed to high levels of generalized anxiety symptoms predicted a twice as high likelihood to perceive harmonious relationships with both their parents and best friends. Nevertheless, adolescents with low and high levels of generalized anxiety symptoms exhibited similar trends in relationship development. Overall, our findings indicate that generalized anxiety symptoms are not deterministic markers for relationship difficulties as there were plenty of adolescents with high levels of generalized anxiety symptoms that experienced no relationship difficulties across adolescence.

Adolescence is characterized by many developmental challenges in family and peer relationships (e.g., Sullivan, 1953; Youniss & Smollar, 1985). These challenges may give rise to worry that centers on social-evaluative concerns and consequently triggers the development of generalized anxiety symptoms (e.g., Newman & Llera, 2011). Particularly those with high levels of generalized anxiety symptoms may have difficulties in relationship development as they often report more interpersonal problems than adolescents with low levels of generalized anxiety symptoms (e.g., Hale, Engels, & Meeus, 2006). Large individual differences are also likely to emerge in the relationship development of adolescents with high and low levels of generalized anxiety symptoms as not all individuals develop similarly (e.g., Hadiwijaya, Klimstra, Vermunt, Branje, & Meeus, 2017). This study aims to explore the individual differences in relationship development with parents and friends in adolescents with high and low levels of generalized anxiety symptoms.

Interpersonal Relationship Development During Adolescence

During adolescence, perturbations in family relationships occur while friendships become more close and important. Specifically, maturational (Youniss & Smollar, 1985) and realignment (Collins & Luebker, 1994) theories propose that conflict intensity increases in parent-adolescent relationships as adolescents strive for more independence. They also propose that these conflicts diminish as adolescents form a more egalitarian relationship with their parents. In addition, the developmental theory of interpersonal relationships (Sullivan, 1953) states that playful relationships with friends during childhood become more emotional and intimate during adolescence. Empirical studies support such a pattern of development in adolescent relationship with parents (e.g., De Goede, Branje, & Meeus, 2009b; van Wel, 1994) and friends (e.g., De Goede, Branje, & Meeus, 2009a; Way & Greene, 2006). However, most studies on adolescent relationship development with parents and friends have examined these relationships separately rather than together in the same design (e.g., Hadiwijaya et al., 2017; Seiffge-Krenke, Overbeek, & Vermulst, 2010). This is a shortcoming, as there are several theoretical notions suggesting that adolescent relationship development with parents and friends intertwine.

More specifically, some theoretical notions suggest a spillover phenomenon, in which the relationship quality with parents and friends become relatively concordant as the relational quality in one domain generalizes to the other domain (e.g., Ehrlich, Dykas, & Cassidy, 2012). For instance, attachment theory suggests that adolescents form mental representations based on the relationship with their parents and that they use these to develop a certain way of dealing with their friends (Bowlby, 1978). Likewise, social cognitive theory suggests that adolescents' relationship with their parents affects the relationships with their friends through modeling and imitation (Bandura, 1977).

According to both theories, a tumultuous relationship with parents would thus yield difficulties in the relationship with friends, whereas a satisfactory relationship with parents would yield close relationships with friends.

Other research suggests a compensation phenomenon (Helsen, Vollebergh, & Meeus, 2000; Scholte, Van Lieshout, & Van Aken, 2001). This entails that adolescents' relationships with parents and friends become relatively discordant as adolescents compensate the lack of connectedness in one relationship by seeking for connectedness in another relationship. The turn-to-friends hypothesis as a specific compensation phenomenon suggests that adolescents who experience a tumultuous relationship with their parents compensate the lack of connectedness with their parents by turning to their friends for support (e.g., Helsen et al., 2000). Similarly, those with tumultuous friendships would compensate the absence of connectedness by having close family relationships as they turn to family for support.

Numerous variable-centered studies have documented evidence for both spillover and compensation phenomena. These studies generally examined associations between variables for the entire sample (e.g., correlations, regressions). Some of these studies provided evidence for spillover by showing positive links between adolescents' relationship representations of parents and friends (e.g., Furman & Collibee, 2016) and between parental and friend support (e.g., De Goede, Branje, Delsing, & Meeus, 2009; Stice, Ragan, & Randall, 2004). Other studies provided evidence for compensation by revealing that a poor relationship with parents is linked to an earlier initiation of romantic and sexual activities (e.g., Ream & Savin-Williams, 2005) and stronger attachment to friends (e.g., Markiewicz, Lawford, Doyle, & Haggart, 2006).

However, most variable-centered studies ignored potential individual differences. Such studies provide information valid for the average individual in the sample that might not be true for subsamples deviating from this average. Thus, such studies could only find evidence for either compensation or spillover. This is a limitation because studies generally suggest that both phenomena could be present, but that they emerge in different groups of individuals (e.g., Kan & McHale, 2007). Also, variable-centered studies generally focus on single components of relationships (e.g., support) rather than using constellations of relational components (e.g., support, dominance). This is a limitation as relationship quality can only be understood if combinations of multiple dimensions are considered. High levels of support and dominance indicate an authoritative relationship quality, whereas high levels of support and low levels of dominance indicate an egalitarian relationship quality. Thus, high levels of support may have a different meaning depending on whether they co-occur with high or low levels of dominance.

Person-centered studies are ideal to test whether spillover and compensation co-occur as such studies not only account for the multidimensional nature of relationships, but also capture potential individual differences. Such studies can generate relationship profiles of different relational aspects of family relationships and friendships at once, and as such allow to examine individual differences in relationship quality. By doing so, person-centered studies identified three to five relational profiles that reflect individual differences among adolescents in concordant and discordant relationships with parents and friends (e.g., Cohen et al., 2015; Kan & McHale, 2007; Scholte et al., 2001). These studies revealed profiles of adolescents having concordant harmonious (e.g., high levels of support and low levels of conflict) or turbulent (e.g., low levels of support and high levels of conflict) relationships with both their parents and friends. They also revealed profiles of adolescents having discordant relationships with parents and friends, such as good relationship with parents and a poor relationship with friends.

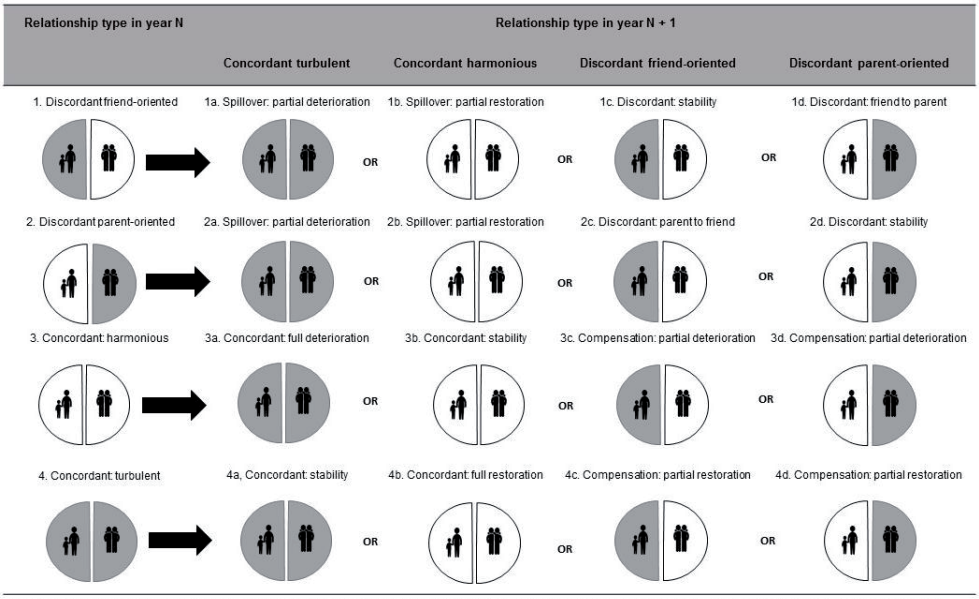
Previous person-centered studies mainly captured concordant and discordant relationships of adolescents with parents and friends in a cross-sectional design (e.g., Cohen et al., 2015; Kan & McHale, 2007; Scholte et al., 2001; Schwartz, Rhodes, Chan, & Herrera, 2011), whereas only few captured these longitudinally (e.g., Laursen, Furman, & Mooney, 2006). However, to investigate whether the quality of adolescent relationship with parents spills over to the quality of relationship with friends, one should capture the extent to which discordant relationships become more concordant. Additionally, to examine whether adolescent social relationships compensate each other, one should capture the extent to which concordant relationships become discordant. These phenomena thus indicate a change in relationships over time, which can only be captured using longitudinal person-centered study designs.

Spillover and compensation phenomena can manifest themselves in different ways as concordant and discordant relationships could develop in numerous manners. As can be seen in Figure 1, both spillover and compensation phenomena can reflect a partial deterioration or partial restoration in relationships. Spillover with partial deteriorations reflects a positive friendship or relationship with parents that becomes more negative as the other relationship already was more negative. An example of this are adolescents who changed from discordant friend-oriented or parent-oriented relationships to concordant turbulent relationships (i.e., notations 1a and 1b of Figure 1). Spillover with partial restorations reflects a negative friendship or relationship with parents that becomes more positive as the other relationship already was. For example, adolescents may change from discordant friend-oriented or parent-oriented relationships to harmonious relationships (i.e., notations 1b and 2b of Figure 1).

Compensation with partial deteriorations reflects a positive friendship and a positive relationship with parents in which one of these two relationships becomes more negative while the other relationship remains positive. For example, adolescents could switch from concordant harmonious relationships into discordant friend-oriented or parent-oriented relationships (i.e., notations 3c and 3d of Figure 1). Compensation with partial restorations reflects a negative friendship and a negative relationship with parents in which one of these two relationships becomes more positive, while the other relationship remains negative. For example, those who switched from concordant turbulent relationships into discordant friend-oriented or parent-oriented relationships follow this pattern (i.e., notations 4c and 4d of Figure 1)

It is important to keep in mind that adolescents can also show patterns of relationship development that are not indicative of spillover or compensation. As illustrated in Figure 1, adolescents can also show relationship stability (i.e., notations 1c, 2d, 3b, and 4a), or full deteriorations or full restorations of concordant relationships (i.e., notations 3a and 4b of Figure 1). In addition, they can also shift from discordant friend-oriented relationships to discordant parent-oriented relationships or vice versa (i.e., notations 1d and 2c of Figure 1). However, this paper mainly focuses on spillover and compensation. These phenomena theoretically reflect the most common patterns of interpersonal relationship development (i.e., interdependency of friend and parental relationships), but no study has yet examined these thoroughly. Given the importance of satisfying relationships, extending previous studies using a longitudinal person-centered design could provide profound insights in spillover and compensation.

Generalized Anxiety Symptoms and Interpersonal Relationship Experiences.
The fact that individual differences in relationship development occur, raises the question of which factors are linked to these differences. Particularly important to consider are generalized anxiety symptoms. Individuals with high levels of generalized anxiety symptoms may be more susceptible to develop relationships that are of relatively poor quality for three main reasons. First, the core symptom of generalized anxiety is excessive, persistent, and uncontrollable anxiety and worry in which social functioning and relationships are reported as the most common topic of worry (e.g., Borkovec, Alcaine, & Behar, 2004). Individuals with high levels of generalized anxiety symptoms seem to perceive a sustained state of distress that contributes to a negative bias in their relationship perceptions (e.g., Newman & Llera, 2011). These individuals are thus likely to interpret their relationships as poor even if they are not according to the others involved in these relationships.



Note. Left domains represent adolescent relationships with their parents; right domains represent adolescent relationship with their best friend. Non-shaded domains represent satisfactory relationships and shaded domains represent poor relationships. Symbols are taken from and designed by Flaticon (www.flaticon.com).

Figure 1
Potential changes in adolescent concordant and discordant relationship with parents and best friend

Second, it is also likely that the actual relationship quality is poor due to the negative impact of generalized anxiety symptoms (Newman & Llera, 2011). For instance, excessive reassurance seeking can be demanding for parents and friends, and this may lead to frustrations for everyone involved (e.g., Priest, 2013). Also, sustained feelings of distress could lead to a negative bias in which individuals fail to read social cues about their behavior, and this could make such individuals less liked by others (e.g., Erickson & Newman, 2007).

Third, generalized anxiety symptoms are relatively prevalent among adolescents (e.g., Hale et al., 2006). Specifically, generalized anxiety symptoms generally increase in adolescence and further progress into adulthood (e.g., Nelemans et al., 2014). This is unlike many other anxiety symptoms, such as social and separation anxiety symptoms that generally decrease over the course of adolescence (e.g., Nelemans et al., 2014). Altogether, these three reasons illustrate the importance of examining generalized anxiety symptoms and social relationships in adolescents.

Despite the aforementioned reasons, only a limited number of studies have examined adolescent generalized anxiety symptoms and interpersonal relationships. Some of these studies revealed that generalized anxiety symptoms relate to experiences of parental

rejection and less secure parental attachment (e.g., Hale, Klimstra, Branje, Wijsbroek, & Meeus, 2013) . Other studies showed that although adolescents with higher levels of generalized anxiety symptoms have fewer friends; their friendships are not necessarily of a lesser quality when compared to less anxious adolescents (e.g., Scharfstein, Alfano, Beidel, & Wong, 2011). One recent study, using the same dataset as the present study, did find poorer friendship quality among adolescents with generalized anxiety symptoms (Meeus, Schoot, Hawk, Hale, & Branje, 2016).

However, previous studies examining these linkages were mainly cross-sectional and variable-centered. Thus, it remains unknown how individual differences in the spillover and compensation phenomena in relationship development would manifest in adolescents with low and high levels of generalized anxiety symptoms. To overcome this, the present study will use a longitudinal person-centered research design to investigate the spillover and compensation phenomena in adolescents with low and high levels of generalized anxiety symptoms.

Study Goals and Hypotheses

The aim of this study is to test spillover and compensation phenomena in adolescent relationship development with their parents and best friend, and the differences herein between adolescents with low and high levels of generalized anxiety symptoms. Recall that perceived relationship quality with parents and friends can either be concordant (i.e., similar to each other) or discordant (i.e., different from each other). Thereby, spillover indicates that adolescent perceived relationship quality with parent and friend becomes concordant, whereas compensation indicates that adolescent relationship quality with parent and friend becomes discordant. We hypothesize that some adolescents show spillover (i.e., discordant → concordant relationships), whereas others show compensation (i.e., concordant → discordant relationships). Thus, we expect individual differences in relationship development with parents and friends.

In terms of concordant relationship development, we based our hypotheses on literature that suggested a temporary decline in relationship quality in early to middle adolescence (e.g., Collins & Luebker, 1994; Youniss & Smollar, 1985). We expect that, on average, parent-adolescent relationship quality will be poorer in early adolescence than in late adolescence and that these relationship difficulties will also generalize to friendships. Therefore, we expect an increase of concordant poor relationship quality profiles in early adolescence and an increase of concordant satisfactory relationship quality profiles in late adolescence. In terms of discordant relationship development, we based our hypothesis on literature suggesting that adolescents tend to separate themselves from their parents while their friendships become more salient (e.g., Sullivan, 1953; Youniss & Smollar, 1985). Therefore, we expect to find an increasing number of adolescents that

move away from a discordant parent-oriented relationship or change into a discordant friend-oriented relationship.

Finally, we expect adolescents with high levels of generalized anxiety symptoms to perceive more concordant relationships of poor quality than those with low levels of generalized anxiety symptoms. In terms of transitions, we expect that adolescents with high levels of generalized anxiety symptoms are more likely to show deteriorations in their interpersonal relationships than those with low levels of generalized anxiety symptoms.

Method

Procedure

Data for the current study were collected as part of a longitudinal research project titled Conflict and Management of Relationships in The Netherlands. Data were collected among students/pupils of various high schools in the province of Utrecht, The Netherlands. Both adolescents and their parents received an invitation letter describing the research project and goals. The letter also provided information on how to decline from participation. Parents had to provide consent for their child to participate in this study and adolescents themselves had to provide consent for their participation. More than 99% of the approached parents and adolescents signed the informed consent form. Confidentiality of responses was guaranteed to all participants. Adolescents completed the questionnaires at school or at home at annual measurement waves and received verbal and written instructions. For every wave they participated in, adolescents received a reward of €10 (approximately US$ 11).

Participants

Five measurement waves were used in the present study, with a one-year interval between each of these waves. The study sample (N = 1,313) included two age groups: an early adolescent cohort (n = 923; M_{age} = 12.4 years, SD = 0.57 at the first wave) and a late adolescent cohort (n = 390; M_{age} = 16.7 years, SD = 0.81 at the first wave). Thus, we use a two-cohort five-wave longitudinal study design covering ages 12 to 16 and 16 to 20. The early adolescent cohort included 50.8% males, whereas the late adolescent cohort included 43.4% males. At the first measurement wave, the majority of adolescents in both age groups reported that they lived with both parents (84.9%). Others reported living with their mother (7.7%) or elsewhere (e.g., with their father, with their biological parent and stepparent, or with other family members). Most participants identified themselves as Dutch (85.8%), and others identified themselves as members of the most common ethnic minorities in The Netherlands (e.g., Surinamese, Antillean, Moroccan). Overall, approximately 10.6% of the relationship quality data was missing across waves.

Little's (1988) Missing Completely at Random test indicated that these data were likely missing at random ($\chi 2/df = 1.40$; Bollen, 1989). This suggests that adolescents with missing data were similar to those with complete data. For this reason, we included adolescents with missing data in the analyses using maximum likelihood estimation with incomplete data (Hox, 1999).

Measures

Adolescent relationship quality with parents and best friend. We used the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985) to measure adolescents' perceptions of relationship quality with their mothers, fathers, and best friend. We included three key components defining close relationships: support, negative interaction, and power (e.g., de Goede et al., 2009). Support refers to nurturance and affection, negative interaction includes conflict and antagonism, and power represents dominance and equality.

Specifically, adolescents reported their perceived level of support they received from, the intensity of negative interaction they experienced with, and the amount of relative power attributed to their fathers, mothers, and best friend. Adolescents indicated on a 5-point Likert scale (i.e., 1, "A little or not at all", to 5, "More is not possible") the degree to which each of the items described what they experienced. The support scale included 12 items (e.g., "How much does your mother really care about you?". The negative interaction scale included six items (e.g., "Do you and your father get on each other's nerves?". The power scale included another six items (e.g., "To what extent is your best friend the boss in your relationship?"). Cronbach's alphas across waves were ≥.79 for all scales.

Please note that we collapsed the scores for adolescent-mother and adolescent-father relationship quality. We did this for two reasons. First, principal component analysis showed that the underlying factors represented three relationship components rather than different adolescent-mother or adolescent-father relationship factors. Second, we aimed to identify straightforward profiles representing adolescents' family and friend relational domains.

Generalized anxiety symptoms. We used nine items of the Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997) to measure generalized anxiety symptoms. Adolescents had to report on a 3-point Likert scale (i.e., 1, 'almost never', to 3, 'often') the degree to which each of the items described what they experienced. Example items are 'I worry about how well I do things' and 'I worry about the future'. The SCARED has good psychometric properties (e.g., Hale, Crocetti, Raaijmakers, & Meeus, 2011). Cronbach's alpha was >.77 across waves.

Data analyses

Main analysis: development of adolescents' relationship profiles. To examine change from certain interpersonal relationship profiles into others, latent transition analyses (LTA) were performed in Latent GOLD version 5.1 (Vermunt & Magidson, 2013). LTA models are an advanced longitudinal extension of latent profile analysis (LPA). LPA aims to identify classes or profiles of individuals in a sample using a set of observed variables at one time point. To examine the extent to which individuals change from one profile to another profile over time, LPA can be extended to LTA. LTA generates initial classification probabilities and transition probabilities using a set of observed variables for consecutive time points (Vermunt, Tran, & Magidson, 2008). Initial classification probabilities reflect the probability of an adolescent belonging to a certain profile at baseline (i.e., the first wave of the current study). Transition probabilities refer to the probability of an adolescent moving to profile Y on the next measurement wave (e.g., wave 2) conditional on having been in profile X on the previous wave (i.e., wave 1). Thus, with LTA we can examine the extent to which adolescents who belong to a certain interpersonal relationship profile change into another profile on both short-term (i.e., wave 1 to wave 2) and long term (i.e., wave 1 to wave 5).

To examine whether initial classification and transition probabilities differ between younger and older adolescents and adolescents with low and high levels of generalized anxiety symptoms, we examined the fit of LTA models with the covariate age cohort (i.e., early to middle adolescence versus middle to late adolescence), generalized anxiety symptoms trajectory (i.e., adolescents with low and high levels of generalized anxiety symptoms), and both covariates (i.e., age cohort and generalized anxiety symptoms trajectory). By doing so, we investigated whether younger adolescents were more likely to perceive poor relationships when compared to older adolescents and whether adolescents low on generalized anxiety symptoms were more likely to perceive poor interpersonal relationships than adolescents high on these symptoms.

We used two criteria to select the best and final LTA model solution. First, the Akaike information criterion (AIC; Akaike, 1987) and Bayesian information criterion (BIC; Schwarz, 1978) should be the lowest, as lower values indicate an improvement in model fit (e.g., Collins & Lanza, 2010). Second, each profile should include more than 5% of the sample. Less prevalent profiles indicate rare subsamples that may not represent common or general types.

Preliminary analysis: adolescents with low and high levels of generalized anxiety symptoms. To identify generalized anxiety symptoms as a moderator of adolescents' relationship development with parents and friends, we identified adolescents low and high on generalized anxiety symptoms across years. To do this, we performed a

preliminary analysis using latent class growth models in Latent GOLD version 5.1. This analysis can identify distinct homogeneous developmental trajectories (i.e., low levels or high levels of symptoms) within a heterogeneous sample (i.e., our adolescent total sample). Trajectories are based on the initial levels (i.e., intercepts) and growth rates (i.e., slopes) of individual scores on a set of variables (i.e., generalized anxiety symptoms). Hereby, we identified that a two-class developmental trajectory is best. Please see Text A in the supplemental material for information on the identification of these trajectories.

The first class included 78% of the sample and showed a low level of generalized anxiety symptoms ($M_{intercept}$= 1.26) that remained relatively stable over time (M_{slope}= -0.01, p <.01). The second class included 22% of the sample and has a significantly higher level of generalized anxiety symptoms ($M_{intercept}$= 1.83) that slightly increased (M_{slope}= 0.03, p <.01). Initial levels and change of generalized anxiety symptoms of these two classes were significantly different from each other (p <.05). Thus, the first class represents adolescents low on generalized anxiety symptoms and the second class represents those high on generalized anxiety symptoms.

Results

Model Selection of the Latent Transition Analysis

We tested latent transition models for up to six relationship profiles (see Table 1 of the supplemental material). Solutions up to six latent profiles led to lower BIC and AIC-values, suggesting that each additional profile improved model fit. When examining the profiles more specifically, the five-profile solution appeared to be the most meaningful. The six-profile solution included a sixth class that represented a rare relationship profile (i.e., 10% in younger adolescents and < 5% for older adolescents) and the four-profile solution showed a worse model fit than the five-profile solution. Thus, we selected the five-profile solution as the final model.

Finally, likelihood ratio tests showed that the inclusion of the covariates age cohort and anxiety symptoms (*LL*: -15542.92; *df* : 132) significantly improved the model fit (p <.001) when compared to the model with no covariates (*LL*: -15652.20; *df* : 84), with only age cohort (*LL*: -15609.42; *df* : 108), and with only anxiety symptoms as covariates (*LL*: -16689.33 *df* : 108). Hence, we chose the model with the covariates age cohort and anxiety symptoms as our final model. Our final model thus represented five profiles with classifications and transitions among profiles being different for the four groups we distinguish in this study (i.e., younger adolescents with low and high levels of anxiety symptoms; and older adolescents with low and high levels of anxiety symptoms).

Profiles of Adolescents' Relationship Quality with Parents and Best Friend

Using the data of all waves, we found five relationship quality profiles reflecting concordant relationships, in which adolescents' perceived relationship quality with their parents is relatively similar to the relationship quality with their friend and discordant relationships, in which adolescents' perceived relationship quality with their parents more strongly differs from the relationship quality with their friend[2]. We labelled the three concordant profiles as *turbulent (17%* of the sample*), harmonious (13%* of the sample*),* and *average (13%* of the sample*)*. Additionally, we labelled the two discordant profiles as *friend-oriented (35%* of the sample*)* and *parent-oriented*[3] *(22%* of the sample*)*. Figure 2 displays these profiles. Table 1 illustrates the mean scores on relationship quality of each relationship profile based on the data of all waves.

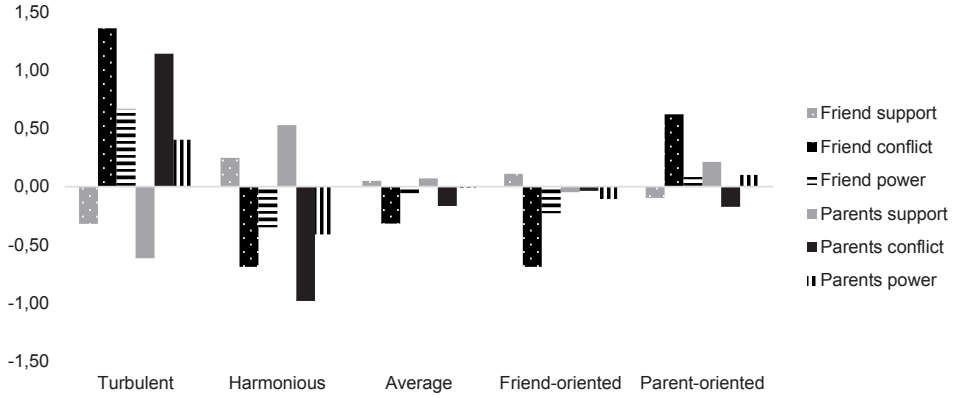


Figure 2

Five-class solution profiles of relationship quality based on adolescents' perceived support, negative interaction, and power in the relationship with their parents and best friend

2 We refer to Text B of the supplemental material for further information regarding mean-level differences between adolescents' relationship experiences with their parents and their friends.

3 We refer to Text C of the supplemental material for further a further explanation of the parent-oriented profile.

Table 1
Three-step ANOVA Mean Comparisons of Relationship Profiles for Each Relationship Domain

	Turbulent	Harmonious	Average	Friend-oriented	Parent-oriented	Total	
Relationship quality	(*n* = 221)	(*n* = 172)	(*n* =170)	(*n* =464)	(*n* = 284)	(*N* = 1,313)	Wald χ^2
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	
Parents							
Support	3.03 (0.71)[a]	3.77 (0.55)[b]	3.49 (0.60)[c]	3.41 (0.61)[d]	3.58 (0.51)[e]	3.44 (0.64)	892.18*
Negative interaction	2.11 (0.62)[a]	1.00 (0.00)[b]	1.41 (0.39)[c]	1.49 (0.40)[d]	1.40 (0.30)[e]	1.50 (0.51)	8812.44*
Power	2.69 (0.71)[a]	2.18 (0.64)[b]	2.43 (0.61)[cd]	2.36 (0.62)[d]	2.50 (0.59)[c]	2.43 (0.65)	318.41*
Best friend							
Support	2.98 (0.75)[a]	3.40 (0.71)[b]	3.27 (0.70)[c]	3.31 (0.77)[c]	3.16 (0.71)[c]	3.23 (0.75)	148.61*
Negative interaction	1.94 (0.57)[a]	1.00 (0.00)[b]	1.17 (0.00)[c]	1.00 (0.00)[d]	1.59 (0.25)[d]	1.31 (0.45)	27832.15*
Power	2.16 (0.66)[a]	1.59 (0.51)[b]	1.76 (0.48)[c]	1.66 (0.48)[d]	1.84 (0.50)[c]	1.79 (0.55)	615.55*

Note. *p <.001. Samples with different superscripts across rows significantly differ from one another with regard to relationship quality. Superscripts are sorted from high to low levels of perceived support, and from low to high levels of perceived negative interaction and power. Post-hoc tests were Bonferroni corrected with α = 0.003, in which we divided the usual critical p-value of .05 in a two-tailed test by ten (i.e., the total number of profile comparisons). Comparisons of profiles on relationship quality were controlled for gender and age and were conducted using the total sample. We compared the differences in relationship quality between the profiles, while controlling for classification inaccuracy of the relationship profiles using a three-step procedure ANOVA. For more information about this three-step procedure, please see Vermunt (2010).

Relationship Quality Profiles: Prevalence and Individual Transitions

There were significant overall changes in profile prevalence over waves in the early (Wald χ^2 = 162.78, p <.001) and late adolescent cohorts (Wald χ2= 62.32, p <.001) and for adolescents low (Wald χ2 = 191.12, p <.001) and high on generalized anxiety symptoms (Wald χ2= 43.87, p <.001), separately. Table 2 displays the prevalence rates of each profile in each wave and indicates whether they differed between younger and older adolescents, and between those low and high on generalized anxiety symptoms. Table 3 displays the transition probabilities of relationship profiles for younger and older adolescents and for adolescents low and high on generalized anxiety symptoms across a 4-year interval. We mainly focused on transitions across four years, as these illustrate long-term developments. Transitions across a 1-year interval (i.e., short-term developments) are in Table 2 of the supplemental material.

Concordant turbulent and harmonious relationship profiles. Concerning the between-cohort differences in prevalence, we found results that were in line with our expectations. That is, we found a significantly higher prevalence of turbulent relationships profiles in the early adolescent cohort than in the late adolescent cohort. This prevalence increased from 14% to 21% in early adolescence and decreased from 20% to 10% in late adolescence. Relatedly, there was a significantly higher prevalence of harmonious relationship profiles in the late adolescent cohort than in the early adolescent cohort. This prevalence increased from 8% to 21% in late adolescence, whereas the prevalence of this relationship profile remained around 11% to 12% in early adolescence.

We found some transitions that explained the increasing prevalence of turbulent relationships in early adolescence and of harmonious relationship profiles in late adolescence. In terms of spillover with partial deteriorations (i.e., notations 1a and 1b of Figure 1), younger adolescents in a parent-oriented relationship were significantly more likely than older adolescents to change into a turbulent relationship (i.e., 24% versus 11% for younger and older adolescents, respectively). In terms of spillover with partial restorations (i.e., notations 1b and 2b of Figure 1), older adolescents in a parent-oriented relationship were more likely to change into a harmonious relationship when compared to younger adolescents (i.e., 17% versus 10% older and younger adolescents, respectively). Thus, spillover with partial deteriorations from parent-oriented into turbulent relationships emerged in early adolescence, whereas spillover with partial restorations from parent-oriented into harmonious relationships emerged in late adolescence[4].

4 We also identified these patterns among adolescents with low and high levels of generalized anxiety symptoms.

Table 2
Percentage Rates of Relationship Profiles Across Time

	Percentage rates of relationship types across time				
	Turbulent	Harmonious	Average	Friend-oriented	Parent-oriented
Age in years	Early adolescent cohort (n = 923)				
12	14.0%	11.3%	13.9%	34.1%	26.7%
13	17.0%	12.0%	12.4%	34.9%	23.7% [a]
14	18.8% [a]	12.1% [a]	12.0%	34.5%	22.5% [b]
15	20.0% [b]	12.0% [b]	11.8%	34.1%	22.0%
16	20.8% [c]	11.9% [c]	11.7%	33.8%	21.8%
	Late adolescent cohort (n = 390)				
16	20.4%	8.6%	15.3%	35.7%	20.1%
17	15.3%	14.1%	14.6%	38.3%	17.7% [a]
18	12.6% [a]	17.6% [a]	14.1%	38.6%	17.0% [b]
19	11.1% [b]	19.7% [b]	13.9%	38.6%	16.8%
20	10.2% [c]	20.9% [c]	13.8%	38.5%	16.7%
Assessment wave	Adolescents with lower levels of generalized anxiety symptoms (n = 1033)				
1	12.3%[a]	11.6%	14.9%	35.9%	25.4%
2	12.5%[b]	14.3% [a]	13.6%	37.3% [a]	22.3%
3	12.7% [c]	15.6% [b]	13.2%	37.2% [b]	21.3%
4	12.8%[d]	16.3% [c]	13.0%	36.9% [c]	20.9%
5	12.9%[e]	16.6% [d]	12.9%	36.7% [d]	20.8%
	Adolescents with higher levels of generalized anxiety symptoms (n = 280)				
1	29.2% [a]	6.4%	12.4%	29.6%	22.3%
2	31.2% [b]	6.7% [a]	11.0%	30.7% [a]	20.4%
3	32.8% [c]	6.9% [b]	10.6%	30.4% [b]	19.3%
4	34.0% [d]	7.0% [c]	10.3%	30.0% [c]	18.7%
5	34.9% [e]	7.1% [d]	10.1%	29.7% [d]	18.3%

Note. For the younger and older adolescents comparisons, superscripts reflect a significant difference in percentage between the early and late adolescent cohorts. For example, the significant difference in turbulent relationship percentage rates between adolescents of the age 14 (18.8%) versus 18 (12.6%) years. For the low and high anxiety symptoms comparisons, superscripts reflect a significant difference in percentage rates between adolescents with low and high levels of anxiety symptoms. For example, the significant difference in turbulent relationship percentage rates between adolescents who are low (12.3%) and high (29.2%) on generalized anxiety symptoms on the first wave. All post hoc-analyses were Bonferroni corrected (α = .001), in which we divided the p-value of .05 in a two-tailed test by 25 (i.e., the total number of profile comparisons).

Table 3
Transition Probabilities of Relationship Change Across a Four-Year Interval

Relationship type in year N	Transition probabilities for relationship type in year N+4				
	Turbulent	Harmonious	Average	Friend-oriented	Parent-oriented
	Early adolescent cohort (n = 923)				
Turbulent	0.51 [a]	0.05 [a]	0.08 [a]	0.22 [a]	0.14
Harmonious	0.19	0.13	0.12	0.34	0.22
Average	0.24 [b]	0.10 [b]	0.11	0.32	0.22
Friend-oriented	0.24 [c]	0.10 [c]	0.11	0.33	0.22
Parent-oriented	0.24 [d]	0.10 [d]	0.11	0.32 [b]	0.22
	Late adolescent cohort (n = 390)				
Turbulent	0.18 [a]	0.16 [a]	0.14 [a]	0.36 [a]	0.16
Harmonious	0.10	0.23	0.13	0.38	0.17
Average	0.13 [b]	0.17 [b]	0.14	0.39	0.18
Friend-oriented	0.11 [c]	0.18 [c]	0.13	0.39	0.18
Parent-oriented	0.11 [d]	0.17 [d]	0.14	0.39 [b]	0.19
	Adolescents with lower levels of generalized anxiety symptoms (n = 1033)				
Turbulent	0.14 [a]	0.17 [a]	0.14 [a]	0.37 [a]	0.18
Harmonious	0.10 [b]	0.20	0.13	0.36	0.20
Average	0.10 [c]	0.19 [b]	0.13	0.38	0.20
Friend-oriented	0.10 [d]	0.19 [c]	0.13	0.37	0.20
Parent-oriented	0.11 [e]	0.17 [d]	0.13	0.37	0.21
	Adolescents with higher levels of generalized anxiety symptoms (n = 280)				
Turbulent	0.52 [a]	0.05 [a]	0.08 [a]	0.22 [a]	0.12
Harmonious	0.20 [b]	0.15	0.11	0.35	0.19
Average	0.25 [c]	0.09 [b]	0.12	0.34	0.20
Friend-oriented	0.24 [d]	0.10 [c]	0.12	0.35	0.20
Parent-oriented	0.26 [e]	0.08 [d]	0.12	0.33	0.21

Note. For the younger and older adolescent comparisons, superscripts reflect a significant difference in transition values between the early and late adolescent cohorts. For example, the significant difference in transitions from friend-oriented to turbulent in early (0.24) and late (0.11) adolescent cohort. For the low and high anxiety symptoms comparisons, superscripts reflect a significant difference in transition values between the adolescents with low and high levels of generalized anxiety symptoms. For example, the significant difference in transitions from friend-oriented to turbulent in adolescents who are low (0.10) and high (0.24) on generalized anxiety symptoms. All post hoc-analyses were Bonferroni corrected (α =.001), in which we divided the usual critical p-value of .05 in a two-tailed test by 25 (i.e., the total number of profile comparisons).

It should be noted that many of the adolescents in a turbulent relationship did not remain in this relationship (i.e., 49%) and that many of the adolescents in the other relationships did not move into a turbulent relationship (i.e., 76% to 81%) in early adolescence. Comparably, many of the adolescents in a harmonious relationship did not remain in this relationship (i.e., 77%) and many adolescents in the other relationships did not move into this relationship (i.e., 82% to 84%) during late adolescence. Furthermore, not all adolescents demonstrated spillover or compensation. Some adolescents showed a stable relationship quality (i.e., 11% to 51% in the young and old cohort). Some adolescents changed from a certain type of concordant relationship into another type of concordant relationship (i.e., 5% to 24% in the young and old cohort), whereas others changed from a certain type of discordant relationship into another type of discordant relationship (i.e., 18% to 39% in the young and old cohort).

Discordant friend-oriented and parent-oriented relationship profiles. Unlike our expectation that adolescents would increasingly turn to their friends, we found no significant increase of friend-oriented relationships. Instead, we found a significantly decreasing prevalence of parent-oriented relationships in the late adolescent cohort (i.e., 21% to 17%) as well as in the early adolescent cohort (i.e., 27% to 22%). Additionally, there were significantly less parent-oriented relationships in the late adolescent cohort when compared to the early adolescent cohort. This might be due to parent-oriented adolescents being significantly more likely to change into a friend-oriented relationship by late adolescence (i.e., 39%) than in early adolescence (i.e., 32%). Similarly, in terms of compensation with partial deteriorations and restorations (i.e., notations 3c, 3d, 4c, and 4d of Figure 1), younger and older adolescents in harmonious and turbulent relationships were significantly more likely to move into a friend-oriented than into a parent-oriented relationship (p <.01).

Adolescents Low and High on Generalized Anxiety Symptoms

Regarding the prevalence differences between adolescents with low and high levels of generalized anxiety symptoms, findings seem to support our expectations. Findings revealed that adolescents with high levels of generalized anxiety symptoms showed a higher prevalence of turbulent relationship profiles (i.e., increase from 29% to 35%) than adolescents with low levels of generalized anxiety symptoms (i.e., between 12% and 13%). These adolescents also showed a lower prevalence of harmonious relationship profiles (i.e., between 6% and 7%) than adolescents with low levels of generalized anxiety symptoms (i.e., increase from 12% to 17%).

We also identified transition patterns that seemed to explain the aforementioned differences in prevalence rates and that partly supported our expectations. Specifically, adolescents with high levels of generalized anxiety symptoms were significantly more

likely to remain in a turbulent relationship when compared to adolescents with low levels of generalized anxiety symptoms (i.e., 52% versus 14%). In terms of spillover, adolescents with high levels of generalized anxiety symptoms were more likely than adolescents with low levels of generalized anxiety symptoms to show spillover from friends to parents by changing from a parent-oriented relationship into a turbulent relationship (p <.001). They were less likely than adolescents with low levels of generalized anxiety symptoms to show spillover with partial restorations by changing from a parent-oriented relationship into a harmonious relationship (p <.001).

It should be noted that not all adolescents high on generalized anxiety symptoms remained in, or changed into a turbulent relationship. For example, almost half of adolescents high on generalized anxiety symptoms in a turbulent relationship moved away into another relationship (i.e., 48%). Additionally, some adolescents high on generalized symptoms from each of the other four relationships changed into one of these four profiles rather than changing into a turbulent one. Despite these differences, these patterns may explain the higher prevalence of turbulent relationships and lower prevalence of harmonious and friend-oriented relationships in adolescents with high levels of generalized anxiety symptoms when compared to adolescents with low levels of generalized anxiety symptoms.

Moreover, adolescents with high levels of generalized anxiety symptoms demonstrated a significantly lower prevalence of friend-oriented relationships (i.e., 30% to 31%) when compared to adolescents with low levels of generalized anxiety symptoms (i.e., 36% to 37%). This might be because adolescents high on generalized anxiety symptoms were significantly less likely to show compensation phenomenon with partial restorations, as they were less likely to change from a turbulent relationship into a friend-oriented relationship (i.e., 22%) than those low on generalized anxiety symptoms (i.e., 37%). However, adolescents with high levels and low levels of generalized anxiety symptoms were similar in changing from a harmonious relationship into a friend-oriented or parent-oriented relationship (p >.05); as well as in the prevalence of parent-oriented relationships quality profiles.

Figure 3a and 3b display the effect of age cohort and anxiety symptoms on adolescents' relationship development. Adolescents with high and low levels of generalized anxiety symptoms show a similar development pattern in early and in late adolescence (i.e., temporary increase in turbulent relationships, an increase in harmonious relationships, and a decrease in parent-oriented relationships). Adolescents high on generalized anxiety symptoms, however, showed higher rates of turbulent relationships and lower rates of harmonious and friend-oriented relationships.

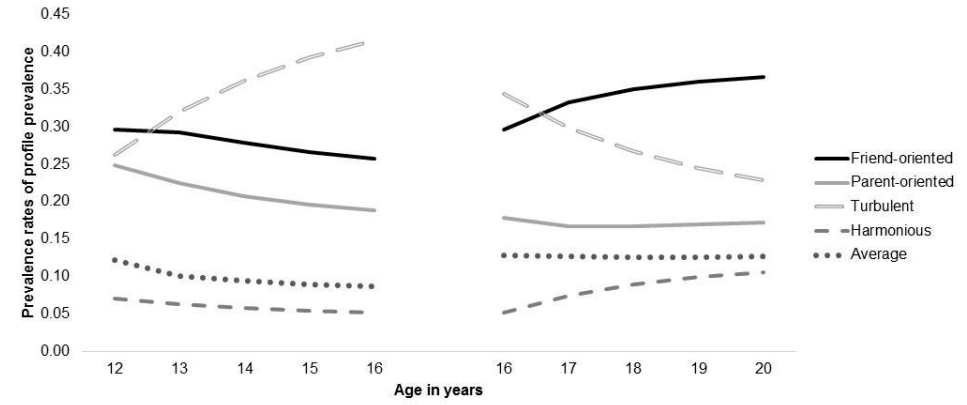


Figure 3a
Relationship profile percentage rates across years of early and late adolescents with lower levels of generalized anxiety symptoms

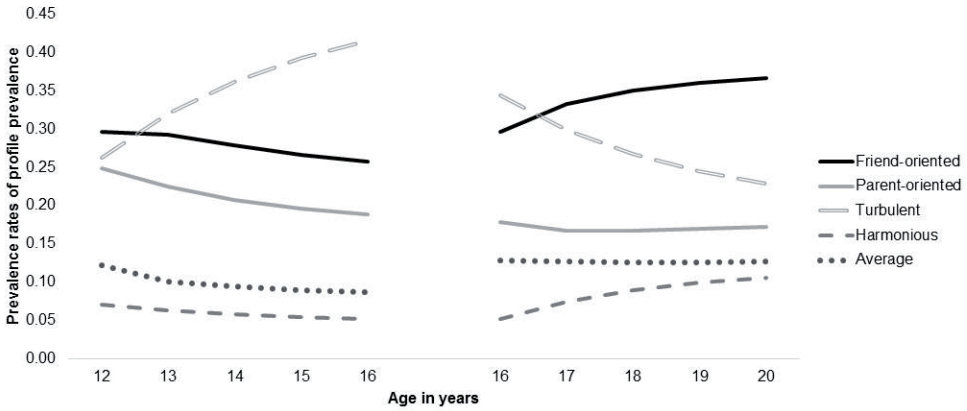


Figure 3b
Relationship profile percentage rates across years of early and late adolescents with higher levels of generalized anxiety symptoms

Discussion

The aim of this study was to test spillover and compensation in adolescents' relationship development, and the differences herein between adolescents with low and high levels of generalized anxiety symptoms. We identified five profiles representing adolescent relationships with parents and friends that were either concordant (i.e., relationships with parents and friends of similar quality) or discordant (i.e., relationships with parents and friends of different quality). From ages 12 to 16 years, the proportion of adolescents that experienced a turbulent relationship with their parents and friend increased. From ages 16 to 20 years, the proportion of adolescents that experienced a concordant turbulent relationship with their parents and friend decreased, whereas the proportion of those in a concordant harmonious relationship with their parents and friend increased. Meanwhile, the proportion of adolescents that experienced a discordant parent-oriented relationship was lower in the late adolescent cohort compared to the early adolescent cohort.

As we explained in the introduction, spillover reflects a change from discordant to concordant relationships with parents and friends, whereas compensation indicates that concordant relationships with parents and friends become discordant. In terms of spillover, we found that discordant friend-oriented and parent-oriented adolescents were equally likely to change into a concordant turbulent or into a concordant harmonious relationship. With regard to compensation, we found that adolescents were significantly more likely to change into a friend-oriented than into a parent-oriented relationship. Moreover, adolescents with low and high levels of generalized anxiety symptoms showed similar patterns of relationship development. However, adolescents with high levels of generalized anxiety symptoms displayed a higher prevalence of turbulent relationships and a lower prevalence of harmonious relationships.

Adolescents' Relationship Quality Profiles

We identified relationship quality profiles representing concordant and discordant relationships with parents and best friend. The turbulent, harmonious, and average profiles reflected a concordant relationship quality across parent and friend relational domains. The friend-oriented and parent-oriented profiles reflected adolescents turning slightly more to their parents or best friend, respectively. Our profiles are also relatively similar to those found in previous person-centered studies (e.g., Cohen et al., 2015; Kan & McHale, 2007; Scholte et al., 2001). In addition, concordant and discordant profiles emerged at similar prevalence rates in early-to-late and late adolescence. In both age cohorts about half of the adolescents perceived concordant relationship quality with their parents and best friend, whereas the other half perceived discordant relationship quality.

Adolescents' Relationship Development

Deteriorations and restorations in relationships. Our findings were partly in line with the maturational (Youniss & Smollar, 1985) and realignment theories (Collins & Luebker, 1994), and with previous studies (e.g., De Goede, Branje, Delsing, et al., 2009; Hadiwijaya et al., 2017; van Wel, 1994). Specifically, in addition to an increasing proportion of poor quality parent-adolescent relationships in the early adolescent cohort, we also found an increasing proportion of poor quality friendships (i.e., turbulent relationships). Furthermore, we found an increasing proportion of satisfactory parent-adolescent relationships in the late adolescent cohort as well as an increasing proportion of satisfactory friendships (i.e., harmonious relationships). Our findings thereby extend the previous literature by revealing that for some adolescents' relationship impairments and improvements do not only manifest in the relationship with parents, but also in the relationship with friends.

Relatedly, our findings provide evidence for the spillover phenomenon (Bandura, 1977; Bowlby, 1978). In the early adolescent cohort, we found that parent-oriented relationships were likely to turn into turbulent relationship. This pattern of change reflects spillover, as adolescents seem to spill over the negativity in the relationship with their parents to the relationship with their friends. In the late adolescent cohort, we found that adolescents with parent-oriented relationships were likely to change into a harmonious relationship. This pattern of change reflects spillover, as adolescents seem to spill over the positivity they experience in the relationship with their parents to the relationship with their friends. Interestingly, younger and older adolescents in parent-oriented and friend-oriented relationships faced similar risks for relationship deteriorations and restorations. Thus, these findings suggest that parent- and peer-oriented adolescents face similar risks and opportunities in subsequent relationship development. Thereby, our findings add to past research that mainly indicated differences in parent-oriented and peer-oriented adolescents (e.g., Markiewicz et al., 2006; Ream & Savin-Williams, 2005).

Our findings also add to the accumulating evidence of adolescents showing far less intensity and stress throughout their personal relationship development than was previously assumed (e.g., Arnett, 1999; Hollenstein & Lougheed, 2013). Variable-centered studies demonstrated general and typical patterns of relationship development in which adolescents' relationship with parents worsens in early adolescence and improves thereafter (e.g., De Goede, Branje, Delsing, et al., 2009; van Wel, 1994; Wray-Lake, Syvertsen, & Flanagan, 2016). Our results seem to be relatively comparable to previous variable-centered research: we identified an increase in turbulent relationships as well as a decrease of parent-oriented relationships in early adolescence and a decrease in turbulent relationships as well as an increase in harmonious relationships in late adolescence. However, we complement previous research by revealing the individual

differences around the mean-level trends. For example, we illustrated that only one-fifth of the younger adolescents experienced turbulent relationships and that also only one-fifth of the older adolescents experienced harmonious relationships with both parents and friends.

Altogether, our study extends previous findings in three ways. First, we revealed that adolescents mainly perceived a tumultuous relationship with their parents and friends in early adolescence. Second, we showed that a tumultuous period only occurred for some adolescents, but not for all. Finally, we demonstrated that turmoil in one relational domain can, but not necessarily does, spill over to the other domain. These promising findings mark the need for studying individual differences in relationship development across adolescence.

Salient friendships in adolescence. Despite the absence of an increase in number of friend-oriented relationships, several of our findings suggest that adolescents' relationships with their friend become increasingly salient (Sullivan, 1953). First, adolescents reporting harmonious or turbulent relationships are more likely to turn to their friends instead of their parents. Second, friend-oriented relationships were the most prevalent type. Third, the increasing prevalence of harmonious relationships suggests that adolescents form increasingly close emotional bonds with their parents as well as with their friends. Thus, the proportion of adolescents experiencing a high-quality relationship with their friends increases. Overall, these findings indicate that friendships become increasingly salient during adolescence, that salient friendships can already manifest themselves in early adolescence, and that high-quality friendship do not necessarily come at the expense of having a worse relationship with one's parents.

It should be noted that the increasing prevalence of high-quality friendships does not necessarily mean that adolescents managed to increase the quality of the relationship with one and the same friend. In the present study, we allowed adolescents' to nominate different best friends at different assessment waves. This means that adolescents could have also replaced unsatisfying friendships with more satisfying ones. Nevertheless, our findings do still suggest that adolescents are better able to make choices that contribute to the formation of closer and more satisfying friendships qualities as they grow older (see review Poulin & Chan, 2010).

Parallel to the increase in the prevalence of high quality friendships, we found that fewer adolescents reported only having a good relationship quality with their parents. The prevalence of parent-oriented relationships decreased in the early adolescent cohort as well as in the late adolescent cohort. However, some adolescents remained parent-oriented or even changed into this relationship quality type. This suggests that some adolescents

separate themselves from their parents to become autonomous and independent individuals (e.g., Youniss & Smollar, 1985), while others do not. Additionally, older adolescents in parent-oriented relationship were more likely to change into a harmonious or into a friend-oriented relationship than younger adolescents. These findings thus show that adolescents who initially had a close relationship only with their parents, tended to form a close relationship with their friend as well (Bandura, 1977; Bowlby, 1978) or form a close relationship with their friend only (e.g., Helsen et al., 2000).

Relationship Development of Adolescents with Low and High Levels of Generalized Anxiety Symptoms

Partly in line with our expectations, we found that adolescents with high levels of generalized anxiety symptoms perceived lower quality of their relationships than adolescents with low levels of generalized anxiety symptoms. Adolescents with high levels of generalized anxiety symptoms perceived more turbulent relationships and less harmonious relationships with their parents and best friends. About one-third of adolescents with high levels of generalized anxiety symptoms experienced a turbulent relationship with their parents and friend, whereas only one-tenth of the adolescents with low levels of generalized anxiety symptoms did. The proportion of adolescents with low levels of generalized anxiety symptoms in harmonious relationships was also twice as high as for adolescents with high levels of generalized anxiety symptoms. Thus, higher levels of generalized anxiety symptoms seem to increase the risk of having difficulties in the relationship with parents and friends. This is in line with the assumption that adolescents with high levels of generalized anxiety symptoms would perceive a poorer quality of relationship development as they often report more interpersonal difficulties (e.g., Hale et al., 2006; Meeus, Schoot, Hawk, Hale, & Branje, 2016).

Still, more than the half of adolescents with high levels of generalized anxiety symptoms did not perceive a tumultuous relationship with their parents and best friend. This is important to note, as previous studies did not reveal such specific nuances (e.g., Hale et al., 2013; Meeus et al., 2016). This may be of interest to both practitioners and researchers alike, since it could inspire further investigations into the factors that protect adolescents with high levels of generalized anxiety symptoms from developing interpersonal difficulties. These findings also emphasize the importance of studying heterogeneity in relationship development, as the key nuances that we revealed in this study would have been overlooked in variable-centered studies.

Second, adolescents with high levels of generalized anxiety symptoms seem to lag behind in relationship development when compared to those with lower levels of generalized anxiety symptoms. Although friend-oriented relationships were common in adolescents with high levels of generalized anxiety symptoms, friend-oriented profiles only become

more prevalent in late adolescence for these individuals. Friend-oriented profiles were already prevalent in early adolescence for those with low levels of generalized anxiety symptoms. Our findings add to previous research by showing that generalized anxiety symptoms do not necessarily affect levels of friendship quality, but that they may cause a delay in the normative developmental course toward acquiring high-quality friendships. Despite differences in the timing, the normative developmental trend does look similar adolescents with low and high levels of generalized anxiety symptoms. Although these similarities could be reassuring, at least one-third of the adolescents with high levels of generalized anxiety symptoms in the older cohort remained in a turbulent relationship with both their parent and friend. This is worrisome, because the more relationships with poor quality one has, the more likely one is to experience psychopathology symptoms (e.g., Cohen et al., 2015). In addition, more relationships of poor quality also increase the likelihood of developing difficulties in romantic relationships (e.g., Seiffge-Krenke et al., 2010).

Study Limitations

The first limitation is our use of self-report measures for relationship quality. Self-reports do not protect against possible biases related to generalized anxiety symptoms. Parents and friends may perceive a different relationship development than adolescents themselves do. Nevertheless, adolescents' own feelings and thoughts in relationships are important in predicting their outcomes generalized anxiety symptoms (e.g., Branje, van Aken, & van Lieshout, 2002).

A second limitation is that our adolescent sample with high levels of generalized anxiety symptom is not necessarily diagnosed with generalized anxiety disorder. Clinical populations may have a stronger negative bias, which could lead to a poorer relationship development than adolescents with low levels of generalized anxiety symptoms or those with sub-clinical symptoms. Adolescents high on generalized anxiety symptoms in our sample (M= 8.75, SD = 1.64) showed scores above or close to the cut-off score of 8 for generalized anxiety in clinical samples (e.g., Muris, Merckelbach, Mayer, & Prins, 2000). Our sample with high levels of generalized anxiety symptoms is thus relatively similar to clinical populations.

A third limitation is that additional factors underlying the reported relationship quality remained unidentified. It remains unclear why some adolescents perceived concordant relationships, whereas others perceived discordant relationships. It also remains unknown why the spillover phenomenon manifested itself in some adolescents, while the compensation phenomenon emerged in others. One underlying factor that may affect individual differences in spillover compensation is social competence (e.g., Kan & McHale, 2007). For example, some adolescents may initially learn adaptive social skills

with parents that makes them bond with their parents and their peers. If the family ties start to worsen, adolescents with adaptive social skills may turn to peers for closeness and become successful among their peers as a result, whereas those with less adaptive skills may also turn away from peers.

A fourth limitation is that we collapsed the scores for adolescent-mother and adolescent-father relationship quality on each component. Examining the parental relational components separately would double the amount of parental relationship dimensions from three to six dimensions. Parental relational dimensions within such profiles may consequently have a larger influence than the three friendship relational dimensions. Additionally, there is evidence that adolescents may report slight differences in the quality of their relationship with their fathers and mothers, but that they report a similar pattern of relationship development for both parents across time (e.g., De Goede, Branje, et al., 2009b; Russell & Saebel, 1997). Our global approach of parent-adolescent relationships combined with friendships thus seemed a good starting point to show the merits of person-centered method for relationship development research.

A fifth limitation is that we covered the period of adolescence using a two-cohort five-wave longitudinal study design (i.e., 12 – 16 years and 16 – 20 years). Both cohorts, however, seem to be quite comparable: we identified similar relationship profiles and consistent mean-levels of relationship variables across both cohorts. Data from both cohorts suggested that mid adolescence was the period in which relationship quality was the poorest.

Finally, we did not examine the causal relationship between adolescents' relationship quality and generalized anxiety symptoms. Thus, it remains unknown whether these symptoms leads to more perceptions of difficulties in relationship development or vice versa.

Conclusions

Despite aforementioned limitations, this longitudinal person-centered study brings profound refinements to the existing literature on adolescent relationship quality. We found important individual differences in the development of relationship quality with their parents and best friend. Previous research typically investigated either the quality of the relationship with parents of with friends. However, our findings show that it is important to explore both the parent and friend relational domain in one and same design. Furthermore, previous studies seemed to point out that a tumultuous period in adolescents' relationship with parents is inevitable, but our study nuanced

this perspective by showing important individual differences in adolescent relationship development. Overall, our findings show that some adolescents perceived a relationship quality with their parents that is similar to the one with their friend while others do not. Some developed a tumultuous or a harmonious relationship with their parents and friend while others turned to their friend or parents. There is thus substantial heterogeneity in adolescents' interpersonal relationship development (Hollenstein & Lougheed, 2013).

By studying heterogeneity in a subsample with low and high levels of generalized anxiety symptoms, we illustrate that the latter group perceived a relatively normative relationship development and that only a subgroup of them developed tumultuous relationships. There are plenty of adolescents with high levels of generalized anxiety symptoms who did not report interpersonal difficulties. Thus, generalized anxiety symptoms are not universal and deterministic markers for perceiving relationship difficulties. These symptoms merely increase the chances of perceiving impairments in relationship development.

Supplementary material

Text A. Preliminary analysis: identification of anxiety trajectories

Our criteria to select the best solution were that the model should have the lowest AIC- and BIC-values, and include profiles with more than 5% of the sample. Results indicated that the two-class solution would be best to answer our research questions. The two-class solution shows an AIC-value of 3852.09, a BIC-value of 3903.89, and a high entropy value of 0.88. We chose this solution because the one-class solution showed worse fit indices (i.e., lower AIC- and BIC-values) than the two-class solution and the three-class solution included a class with only 5% of the sample (n = 69). The latter solution thus seem to include a rare subsample and may provide too little power for subsequent analyses in which we examine the extent to which adolescents from each anxiety class change from one profile into another. Another reason to choose for the two-class solution was that we wanted to use a simple classification (i.e., adolescents with high levels versus low levels) to examine generalized anxiety symptoms as a moderator for adolescents' relationship development. Adolescents were classified in one of these two groups based on their scores on generalized anxiety symptoms across all waves. Afterwards, we used these two groups as a covariate in our LTA models to examine the differences in relationship development between non-anxious and anxious adolescents

Text B. Differences in adolescents' relationship quality with parents and best friend

Adolescents' reports on support, negative interaction and power in the relationship with parents significantly differed from the ones in their relationship with friends. To take account of these differences, we interpret the profiles by looking at the *relative levels* within the parent and friend relationship domains and then compare these levels across these two relationship domains. For example, our turbulent relationship profile is technically a discordant relationship profile as adolescents' scores on support, negative interactions and power in the relationship with parents significantly differ from their relationship with friends. Despite this, we interpreted them as concordant relationship profiles as their levels of relationship quality within the parent and friend domain are relatively similar to each other.

Text C. Further comments on adolescents in the parent-oriented relationship profile

Although adolescents in a parent-oriented profile report high levels of negative interactions with their friend, they do not necessarily have friendship problems. This because parent-oriented adolescents also displayed support from their best friend in similar high levels as friend-oriented adolescents. Parent-oriented adolescents also show normative levels of dominance from their best friend similar to adolescents in the average relationship profile. These findings thus imply that the parent-oriented profile does not indicate friendship problems, as they remain to perceive support and independency from their friend.

Table 1
Fit Statistics of Latent Transition Models up To Six-Classes

Model Covariates	LL	AIC	BIC	Entropy
Cohort and anxiety				
1-profile	-33286.59	66597.19	66659.35	1.00
2-profile	-27633.96	55333.92	55504.87	.82
3-profile	-19821.35	39762.70	40073.51	.85
4-profile	-18758.27	37702.54	38184.29	.84
5-profile	**-15542.92**	**31349.84**	**32033.61**	**.89**
6-profile	-14726.02	29806.04	30722.91	.88

Note. LL = Loglikelihood; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion. The model in bold indicate the most theoretically meaningful and parsimonious model selection for the data.

Table 2
Transition Probabilities of Relationship Change Across a One-Year Interval

Relationship type in year N	Transition probabilities for relationship type in year N+1				
	Turbulent	Harmonious	Average	Friend-oriented	Parent-oriented
	Early adolescent cohort (n = 920)				
Turbulent	0.80[a]	0.01	0.04[a]	0.10[a]	0.06
Harmonious	0.03	0.41[a]	0.13	0.30	0.12
Average	0.11	0.09	0.17	0.36	0.28
Friend-oriented	0.10	0.09	0.11	0.52z	0.18
Parent-oriented	0.11	0.06	0.15	0.25	0.44
	Late adolescent cohort (n = 393)				
Turbulent	0.56[a]	0.01	0.14[a]	0.21[a]	0.09
Harmonious	0.01	0.60[a]	0.08	0.23	0.07
Average	0.09	0.08	0.17	0.46	0.20
Friend-oriented	0.05	0.13	0.12	0.56	0.14
Parent-oriented	0.04	0.06	0.19	0.30	0.41
	Adolescents with lower levels of generalized anxiety symptoms (n = 1033)				
Turbulent	0.52[a]	0.01	0.13	0.22[a]	0.12
Harmonious	0.02	0.48	0.12	0.25	0.12
Average	0.06	0.12[b]	0.19	0.39	0.23
Friend-oriented	0.06	0.15[a]	0.13	0.52	0.14
Parent-oriented	0.07	0.07	0.15	0.31	0.40
	Adolescents with higher levels of generalized anxiety symptoms (n = 280)				
Turbulent	0.82[a]	0.01	0.05	0.09[a]	0.03
Harmonious	0.03	0.50	0.10	0.29	0.08
Average	0.13	0.05[b]	0.14	0.43	0.24
Friend-oriented	0.09	0.08[a]	0.10	0.55	0.18
Parent-oriented	0.09	0.04	0.19	0.23	0.45

Note. All post hoc-analyses were Bonferroni corrected (α = 0.001). For the younger and older adolescents comparisons, superscripts reflect a significant difference in transition values between the early and late cohorts. For example, the significant difference in transitions from turbulent to friend-oriented in early (0.10) and late (0.21). For the low and high generalized anxiety symptoms comparisons, superscripts reflect a significant difference in transition values between adolescents with low and high levels of generalized anxiety symptoms. For example, the significant difference transition from turbulent to friend-oriented in adolescents who are low (0.24) and high (0.09) on generalized anxiety symptoms. An important difference in transitions between the 1-year and 4-year interval is that there was less relationship stability and more differences between early-to-middle and middle-to-late normative and anxious adolescents across a 4-year interval when compared to the 1-year interval. Other than that, transition patterns were relatively similar to each other.

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Chapter 5

The Family Context as Foundation for Romantic Relationships

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Abstract

This eight-wave person-centered study tested whether quality of parent-adolescent relationships as perceived by adolescents, mothers, and fathers predicted young adults' and partners' romantic relationship experiences (N = 759; 46.6% females; M_{age} = 13.11 years, SD = 0.49 at the first wave). An authoritative relationship with parents predicted the highest levels of support, intimacy, and passion, whereas a distant relationship with parents predicted the lowest levels of support, intimacy, and passion in young adults' as well as romantic partners' relationship experiences. Thereby, parent-adolescent relationships predicted partners' romantic relationship experiences in an indirect way: they predicted partners' relationship experiences only if target young adults' romantic relationship experiences were also considered. Parent-child relationships thus have far-reaching, yet subtle effects on later romantic relationships.

Establishing satisfactory romantic relationships is a key developmental task in the transition from adolescence to young adulthood (e.g., Soller, 2014). Various influential developmental theories, such as attachment theory (Bowlby, 1978) and social cognitive theories (Bandura, 1977), commonly illustrate how the family context lays the foundation of later social relationships (e.g., Collins, Welsh, & Furman, 2009). In fact, numerous studies showed that close parent-adolescent relationships predict positive romantic relationships (for an overview see Meeus, 2016). Most of these studies, however, fail to simultaneously capture the multiple relational dimensions of, and multiple perceptions of the parent-adolescent relationship system in predicting later romantic relationship quality (Darling & Cumsille, 2003). This is a limitation as the interpretation of a parent-adolescent relationship quality depends on the relational experiences of adolescents, mothers and fathers. One way to address this limitation is by using a parent-adolescent relationship typology that combines experiences of adolescents as well as their parents on multiple relational dimensions and examine how such a typology relates to romantic relationships. The goal of this study is to produce a parent-adolescent relationship typology to predict later romantic relationship quality using a longitudinal multidimensional and multi-informant study design.

Adolescent Relationship Quality with Parents and Romantic Partners

Adolescents' relationship with parents and romantic partners are both typically conceptualized by some degree of support/warmth and power/authority (Furman & Buhrmester, 1985; Furman & Buhrmester, 1992). In terms of support/warmth, adolescents' relationships with parents and romantic partners are usually both intimate and supportive such that adolescents often turn to their parents or romantic partners to discuss problems, feelings, and doubts. In terms of power/authority, adolescents' relationships with their parents are typically involuntary and hierarchical, whereas adolescents' relationship with their romantic partner is typically voluntary and egalitarian. Parents tend to have more power and authority than their adolescent children do while adolescents tend to have relatively equal status compared to their partners (Laursen, 1996). The importance of these two relational components is also evident in the parenting literature in which features comparable to support and power overarch many conceptualizations of authoritative, indulgent, distant, and authoritarian parenting styles[5] (e.g., Baumrind, 1991). Other differences between parent-adolescent and romantic partner relationships are that romantic relationships are more instable and

5 Although parenting and personal relationships share comparable key concepts of support and power, they are fundamentally different from each other. Parenting conveys parents' attitude *toward* the child which manifest in certain practices that consequently influences the child's development (Darling & Steinberg, 1993). Personal relationships entail a set of interactions *between* two individuals who know each other and take account of each other's behavior (Hinde, 1997). In addition, parenting mainly involves parent and their children, whereas personal relationships may also involve other people such as peers, friends, romantic partners, and acquaintances.

are marked by expressions of affection and sexual behavior (e.g., Laursen, 1996). These relationships are therefore also often conceptualized by other relational components such as intimacy, passion, and commitment (e.g., Lemieux & Hale, 1999; Madey & Rodgers, 2009).

Two major developmental perspectives illustrate how the family context lays the foundation of later social relationships (e.g., Collins et al., 2009). First, the attachment perspective (Bowlby, 1978) states that adolescents form mental representations based on the relationship history with parents during childhood and that these representations affects the way they form personal relationships. Second, the social cognitive perspective (Bandura, 1977) states that adolescents' relationship history with parents during childhood shapes their future personal relationships through modeling and imitation. These two perspectives thus propose a continuity of parent-adolescent relationships into later romantic relationships. For example, a tumultuous parent-adolescent relationship would predict difficulties in romantic relationships, whereas a supportive parent-adolescent relationship would predict close romantic relationships.

The wealth of evidence for the continuity in parent-adolescent relationship quality to romantic relationship quality mainly derived from variable-centered research. Variable-centered research generally focuses on singular or multiple individual source or relational dimensions separately (e.g., Darling & Cumsille, 2003; Laursen, Furman, & Mooney, 2006). For example, these studies have demonstrated that adolescent perceived supportive relationship with parents relate to adolescent perceived satisfactory and committed romantic relationships (e.g., Conger, Cui, Bryant, & Elder, 2000; Fosco, Van Ryzin, Xia, & Feinberg, 2016; Kretschmer, Vollebergh, & Oldehinkel, 2017; Scharf & Mayseless, 2001; Walper & Wendt, 2015).

However, few previous studies take account of the perceptions from adolescents, mothers, and fathers on multiple relational dimensions simultaneously in modeling the influences of parent-adolescent relationships on romantic relationships. This is a major limitation for several reasons. First, according to the family systems perspective (Bowen, 1974), the nature of parent-adolescent relationships depends on systematic interconnected properties such that adolescents, mothers, and fathers influence each other in different ways. These dynamic interaction patterns, in turn, define the quality of their relationship. Second, the nature of parent-adolescent relationships also depends on how these different individuals perceive multiple relational aspects associated with each other (e.g., Laursen et al., 2006). For example, high levels of power exerted by parents, as reported by adolescents and parents, reflect a cooperative authoritative relationship when combined with high levels of adolescents and parental perceived support. In contrast, high levels of power exerted by parents, as reported by adolescents

and parents, illustrate a repressive hierarchical relationship when combined with low levels of adolescent- and parent- perceived support. Given this complexity, research that aims to understand whether a parent-adolescent relationship's quality is satisfactory and how this relationship quality relates to romantic outcomes should ideally include different individual perspectives on several relationship dimensions simultaneously.

One way to address this complexity is by producing a relationship typology (e.g., Darling & Cumsille, 2003; Laursen et al., 2006). A relationship typology could reflect relationship quality profiles that include constellations of multiple relational dimensions from adolescents and their parents. Longitudinal person-centered approaches can generate such a typology by producing profiles using constellations of multiple relational dimensions from different individuals while capturing potential developmental change in parent-adolescent relationship quality over time (e.g., De Goede, Branje, & Meeus, 2009; Hadiwijaya, Klimstra, Vermunt, Branje, & Meeus, 2017). Using a longitudinal person-centered approach to a multidimensional and multi-informant study design would therefore be ideal in modeling parent-adolescent relationship influences on later romantic relationships.

The few studies that applied a longitudinal person-centered approach to capture parent-adolescent relationship influences mainly grasped the multidimensional nature of such relationships, but failed to account for the perceptions on these relationships by multiple family members. One example is the study of Noack and Puschner (1999). In this study, a parent-adolescent relationship typology was created based on adolescents' perceptions on connectedness and individuation. They identified *(i)* high levels of both connectedness and individuation, *(ii)* high connectedness and low individuation, and *(iii)* low connectedness and low individuation. Another example is a study (Seiffge-Krenke, Overbeek, & Vermulst, 2010) that examined the influences of parent-adolescent relationships on romantic relationships using adolescents' perceptions on support-closeness and negative affect. They identified *(i)* normative, *(ii)* increasingly negative, and *(iii)* decreasingly negative/distant mother-adolescent and father-adolescent relationship trajectories. Normative parent-adolescent relationships positively predicted connectedness and sexual attraction in romantic relationships, thereby providing evidence for continuity from parent-adolescent relationships to later romantic relationships. Despite their important findings, these studies lacked parental perspectives on the relationship with adolescent, thereby only modeling a subpart of the parent-adolescent relationship system influences on romantic relationships.

In examining the influences of parent-adolescent relationships on romantic relationships, it would be compelling to examine how far-reaching the influence of the parent-adolescent relationship system is for romantic relationships as perceived by adolescents

and their romantic partner. In fact, it seems likely that adolescents' relationship with their parents relates to the partners' perceptions of this romantic relationship, albeit in an indirect manner. The reason for this is twofold. First, partners' perceptions on romantic relationships might be more likely to be affected by their own family relationships in the similar way that target adolescents' perceptions on romantic relationships are affected by their own family relationships (Bandura, 1977; Bowlby, 1978). Second, the interdependence perspective (Kelley et al., 2003) suggests that individuals belonging to the same dyad influence each other such that adolescents' own perceptions of relationship positively relate to their romantic partners' perceptions of relationship (e.g., Donato et al., 2015; Furman & Simon, 2006; Robins, Caspi, & Moffitt, 2000). Adolescents with a satisfactory relationship with parents may also perceive a satisfactory romantic relationship, and this, in turn, relate to the partner perceiving their relationship to be satisfactory as well.

Based on our review of the literature, we propose an indirect model of parent-adolescent relationship influences on adolescents' partner perceived romantic relationship quality. Figure 1 illustrates this model. Adolescents' relationship with parents shape adolescents' perceptions of romantic relationship quality (i.e., path *a* of Figure 1). In turn, adolescents' own perceptions of romantic relationship positively relate to their partners' perceptions of this relationship (i.e., path *b* of Figure 1). It seems unlikely that adolescents' relationship with parents would directly affect romantic partners' perceptions (i.e., path *c* in Figure 1). Target adolescents' relationships with parents are likely to affect partners' romantic relationship perceptions through target adolescents' own romantic relationship perceptions (i.e., path *a*b* of Figure 1). Until now, it is unclear how parent-adolescent relationships affect the romantic relationship quality as perceived by adolescents as well as their romantic partners. Most studies have focused on adolescents' perceptions on romantic relationships and devoted little attention to partners' perceptions on this relationship.

Study Goals and Hypotheses

To what extent do the parent-adolescent relationship system predicts adolescents' as well as their partners' experiences on romantic relationship quality? We will answer this question in two steps. In the first step, we applied a longitudinal multidimensional and multi-informant person-centered approach to identify parent-adolescent relationship trajectory classes according the family system perspective (e.g., Bowen, 1974). We based our expectations on previous person-centered research on parent-adolescent relationships (e.g., Noack & Puschner, 1999) and parenting styles (Baumrind, 1991) as they provided a typology using concepts comparable to the relational key components support and power. Hence, we expected to find *(i)* an authoritative trajectory class with high levels of support and parental power; *(ii)* an authoritarian trajectory class with low levels of

support and high levels of parental power; *(iii)* an indulgent trajectory class with high levels of support and low levels of parental power; and *(iv)* a distant trajectory class with low levels of support and parental power. We examined the developmental patterns of each trajectory in an exploratory manner.

In the second step, we examined how these parent-adolescent relationship trajectories affect the romantic partner's perceptions of relationship quality through the target adolescents' perceptions of romantic relationship quality. Similar to our expectations on the relational trajectories, we based our expectations on romantic relationship quality outcomes on the parenting literature. Parenting research showed that an authoritative parenting style was the most beneficial for adolescents (e.g., Auslander, Short, Succop, & Rosenthal, 2009; Milevsky, Schlechter, Netter, & Keehn, 2007). For this reason, we expected that an authoritative relationship trajectory would relate to the most adjusted romantic relationship as perceived by adolescents (i.e., path *a* of Figure 1). We also expected that adolescent perceived romantic relationship quality positively predict partner perceived romantic relationship quality (i.e., path *b* of Figure 1). Finally, we expected that parent-adolescent relationship quality would indirectly relate to partner perceived romantic relationship quality through the target adolescent's perceptions (i.e., path *a*b* in Figure 1). We expected that the authoritative trajectory relate to the most adjusted partner perceived romantic relationship quality, through adolescent perceived romantic relationship quality. In examining such effects, we accounted for the effects of gender, living situation, and relationship duration, as these variables affect relationship quality (e.g., Seiffge-Krenke, Overbeek, & Vermulst, 2010).

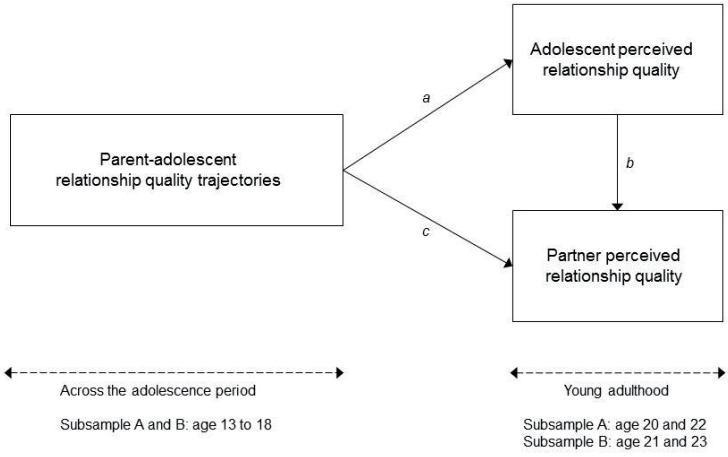

Figure 1
Illustration of the indirect effects of parent-adolescent relationship trajectories predicting romantic partners' perceived relationship quality, through adolescents' perceived relationship quality.

Method

Procedure and Participants

This study uses data from the Research on Adolescent Development and Relationships project (RADAR). The RADAR project is a longitudinal study in The Netherlands. The review board of the local research institute approved of this study.

Recruitment. Adolescents and their parents received an invitation letter describing the research project and goals. The letter also provided an active written informed consent to participate. Parents had to provide consent for themselves and their child adolescent to participate in this study and adolescents had to provide consent for their participation. Adolescents and parents completed questionnaires during home visits with one-year intervals. Completion of the questionnaires took 1.5 hour on average. For each questionnaire, adolescents, mothers and fathers each received a monetary reward of €20. Adolescents nominated their current romantic partner during telephone contact. Research assistants then contacted their romantic partner for participation in the study. If their romantic partner agreed to participate, assistants visited them at home. Romantic partners provided their consent for participation and completed the questionnaires during these home visits. Completion of the questionnaires took one hour on average. Romantic partners received a monetary reward of €25 for every completed questionnaire.

Participant information. Participants consist of two subsamples. Adolescents and parents from Subsample A (i.e., sample Radar old family data) were recruited from the Utrecht province and surroundings in The Netherlands (n =237). Adolescents and parents from Subsample B (i.e., sample Radar young family data) were recruited from the urban areas in the central part of The Netherlands (n =522). Participant recruitment of Subsample A started in 2001 and recruitment of Subsample B started in 2006. Both subsamples included eight waves: the first six waves included reports from adolescents and their family and the last two waves included reports from adolescents and their romantic partner.

Adolescents and parents annually reported their relationship quality from the first to the sixth wave (i.e., covering ages 13 to 18 years). Adolescents from subsample A (M_{age} = 13.03 years, SD = 0.46) were younger than adolescents from subsample B (M_{age} = 13.30 years, SD = 0.51); $t(755) = 7.38$, $p > .001$. Subsample A also included significantly more females (53.2%) when compared to subsample B (43.7%), $c^2(1, N = 759) = 5.89$, $p > .001$. Adolescents from both subsamples did not significantly differ in their romantic relationship status at the seventh and eight wave ($c^2(2, N = 759) = 1.46$, $p <. 481$). We combined these two subsamples as their differences were relatively small (N = 759). The total family sample included adolescents (N = 759; 46.6% females; M_{age} = 13.11 years,

SD = 0.49), fathers (*N* = 680; M_{age} = 46.67 years, *SD* = 5.10), and mothers (*N* = 728; M_{age} = 44.23 years, *SD* = 4.40).

Adolescents and their romantic partners bi-annually reported their relationship quality at the seventh (i.e., around the age of 20 and 21 for subsample A and B, respectively) and eight wave (i.e., around the age of 22 and 23 for subsample A and B, respectively). A proportion of the adolescents reported to be in a romantic relationship at the seventh (*n*= 267) and eight wave (*n*= 294). We only included adolescents who were in a romantic relationship in at least one of these waves (*n* = 374). Of these, 23.3% reported on the relationship quality with the same romantic partner at both waves. Most of the romantic partners that were contacted agreed to participate in the project during the seventh (*n* =245, 91.8%; M_{age} = 21.85 years, *SD* = 7.78) and eight wave (*n* =274, 93.2%; M_{age} = 23.51 years, *SD* = 3.64).

Most of the adolescent participants were Caucasian (i.e., 98.6%) and non-religious (i.e., 57.2%). At the seventh wave, more than half of the adolescents lived with both or with one of their parents (i.e., 61.0%). Additionally, a small proportion of adolescents in a romantic relationship lived together with their partner (i.e., 7.9%). At the eight wave, less than half of the adolescents lived with both or with one of their parents (i.e., 39.2%). Thereby, one-third of adolescents in a romantic relationship lived together with their partner (i.e., 29.2%) The average romantic relationship duration was 26.22 months (*SD* = 18.09) and 36.62 months (*SD* = 26.68) at the seventh and eight wave, respectively. Females were more likely to have longer romantic relationship duration than males at the seventh ($t(252) = -2.17$, $p > .05$) and eight wave ($t(281) = -2.67$, $p > .05$). They were also more likely to live together with their partner than males at the seventh ($\chi^2(1, N = 279) = 8.98$, $p > .01$) and eight wave ($\chi^2(1, N = 305) = 14.91$, $p > .001$).

Across all waves, the average for missing data was 7.3%, 7.4%, 11.6% and 9.9% of adolescents' reports on the relationship quality with their fathers and mothers on the support and power subscales, respectively. The average for missing data was 10.7% and 10.6% of maternal and 16.4% and 16.4% of paternal reports on the support and power subscales, respectively. Participants with missing family data were relatively similar to those with complete data (see page 1 of the supplemental material). Therefore, we included participants with missing family data in the analyses using maximum likelihood estimation with incomplete data (Hox, 1999).

Measures

Adolescent affective quality of the relationship with parents and romantic partners. We assessed the two relational dimensions support and power to define the affective quality of parent-adolescent relationship. Each of these dimensions were assessed using

the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985; Furman & Buhrmester, 1992). The support scale included twelve items and the power scale included six items.

Adolescents reported the level of support they perceived from their fathers, mothers, and romantic partner. Fathers, mothers, and romantic partners of target adolescents also reported their level of support they perceived from the target adolescent. Example items of the support subscale are "How sure are you that this relationship with your [child/father/mother/ romantic partner] will last no matter what?", "How much do you play around and have fun with your [child/father/mother/romantic partner]?" and "How much does your [child/father/mother/ romantic partner] really care about you?" Cronbach's alphas across waves were ≥ .72 for adolescents' reports on mother, ≥ .82 on father, and ≥ .82 on romantic partner; and ≥ .71 for mother reports, ≥ .76 for father reports; and ≥ .85 for romantic partner reports.

In addition, adolescents also reported the amount of relative power they attributed to their fathers, mothers, and romantic partner. Fathers, mothers, and romantic partners of target adolescents also reported the amount of relative power they attributed to target adolescent. The power scale included items such as "How often does your [child/father/mother/ romantic partner] tell you what to do?", "To what extent is your [child/father/mother/romantic partner] the boss in your relationship?", "To what extent is your [child/father/mother/romantic partner] in charge of your relationship and does he/she take the decisions for you?". Note that the interpretation of higher scores on reported power differed for adolescents and their parents. Adolescents that report high levels of power attributed to their parents reflect domineering parents (i.e., hierarchical relationship). Parents that report higher scores on power attributed to their child adolescent reflect domineering adolescents. Cronbach's alphas across waves were ≥ .80 for adolescents' reports on mother, ≥ .83 on father, and ≥ .87 on romantic partner; and ≥ .69 for mother reports, ≥ .71 for father reports; and ≥ .79 for romantic partner reports.

Relationship intimacy, passion, and commitment. The Triangular Love Scale was used to assess intimacy, passion, and commitment in romantic relationships (TLS; Lemieux & Hale, 1999). This scale includes 20 items in which adolescents and their partners reported on a 5-point Likert scale (i.e., 1, "A little or not at all", to 5, "More is not possible") the degree to which each of the items described what they experienced. The intimacy scale included 7 items (e.g., "I can tell everything to my partner"); the passion scale included another seven items (e.g., "Sex is important in our relationship"); and the commitment scale included six items (e.g., "I would rather be with my partner than with anyone else"). Cronbach's alphas for all scales across waves were ≥ .72 for adolescent and ≥ .76 for partner reports.

Table 1 presents the bivariate correlations among all relationship variables. Overall, there were significant correlations among adolescent reports on the relationship with parents and romantic partner. We found significant correlations between adolescent perceptions and parental perceptions on support (i.e., range between r = .23 and r = .42). Adolescent and partner perceptions of support were also significantly correlated with their perceptions on intimacy, passion, and commitment in the relationship (i.e., range between r = .21 and r = .60). Adolescent and partner perceptions on intimacy, passion, and commitment also significantly correlated to each other (i.e., range between r = .11 and r = .51).

Table 1
Correlations Between Relationship Quality Indicators

	1	2	3	4	5	6	7	8	9	10	11	12
1. Adolescent reports on father	-	.58*	-.02	.01	.24*	.04	.03	.05	.12*	.11*	.12*	.13*
2. Adolescent reports on mother	.61*	-	.01	-.05	.19*	-.01	-.01	.05	.07	.01	.11*	.06
3. Father reports on adolescents	.39*	.26*	-	.20*	.02	.04	-.01	.00	-.05	-.15*	-.10	-.10
4. Mother reports on adolescents	.23*	.42*	.37*	-	.05	.08	-.05	-.03	-.03	-.12*	-.10	-.12*
5. Adolescent reports on partner	.32*	.36*	.04	.20*	-	.02	-.06	.01	.08	-.08	.08	.03
6. Partner reports on adolescents	.10	.07	.01	.14*	.35*	-	.07	-.06	-.02	.06	-.02	.12*
7. Adolescent reports on intimacy partner	.29*	.25*	.06	.14*	.63*	.32*	-	.50*	.49*	.36*	.20*	.24*
8. Adolescent reports on passion partner	.28*	.21*	.14*	.20*	41*	.26*	.50*	-	.30*	.19*	.40*	.11
9. Adolescent reports on commitment partner	.07	.14*	-.02	.10	.50*	.30*	.49*	.29*	-	.28*	.08	.51*
10. Partner reports on intimacy adolescent	.07	.05	-.09	.02	.29*	.60*	.36*	.19*	.28*	-	.54*	.48*
11. Partner reports on passion adolescent	.05	.02	-.06	.10	.21*	.49*	.20*	.40*	.08	.54*	-	.29*
12. Partner reports on commitment adolescent	.00	-.00	-.04	.05	.30*	.52*	.24*	.11*	.51*	.48*	.29*	-

Note. Correlations are based on the average scores across all measurement waves (N = 759). Correlations below the diagonal line regards the support aspect. Correlations above the diagonal line regards the power aspect.

Data Analyses

Main analysis I: trajectories of adolescent relationship development. To identify trajectories of parent-adolescent and adolescent-parent relationship quality, we performed latent class growth analysis in the Syntax module of Latent GOLD version 5.1 (Vermunt & Magidson, 2015, 2016), assuming linear growth curves within classes. This analysis identifies distinct homogeneous developmental trajectories (e.g., harmonious, authoritative, distant) within a heterogeneous sample (i.e., our adolescent and parent total sample). Trajectories are based on the initial levels (i.e., intercepts) and growth rates (i.e., slopes) of individual scores on the parent-child relationship variables. Our model is a multivariate growth model based on eight variables: adolescent-mother and adolescent-father reports on support and power (i.e., four variables) and mother-adolescent and father-adolescent reports on support and power (i.e., four variables).

We used three criteria to select the best and final model solution. First, the Akaike information criterion (AIC; Akaike, 1987) and Bayesian information criterion (BIC; Schwarz, 1978) should be the lowest. Second, the profile solution should be theoretically meaningful. Third, profiles should be statistically parsimonious and include at least 10% of the sample that is in a romantic relationship. After selecting the final model solution, we compared the perceptions among adolescents, parents, and romantic partners of across the encountered profiles using pairwise tests between classes.

Main analysis II: trajectory classes and relationship quality. We performed mediation analyses in the Syntax module of Latent GOLD version 5.1 (Vermunt & Magidson, 2015, 2016) to test the indirect effects of parent-adolescent relationship quality trajectories on partner perceptions on relationship quality through adolescent perceived quality. To obtain relational trajectories as an input for analyses, we saved the posterior probabilities of belonging to relational trajectories using the adolescent and parent scores on support and power. These classification probabilities served as input for the path analyses in which classification errors were taken into account using a bias-adjusted three-step procedure[6] (e.g., Bakk, Tekle, & Vermunt, 2013; Vermunt, 2010). We compared the relational trajectory classes with one another using pairwise tests. Since in general it is advised not to assume indirect effects to be normally distributed, the tests for the indirect effects were based on a simulation procedure similar to a parametric bootstrap, in which their distributions were approximated using 500 simulated sets of (direct effect) parameters. In all analyses, gender (i.e., females or males), living situation (i.e., with family or not), and romantic relationship duration were used as control variables (e.g., Bech & Gyrd-Hansen, 2005).

6 We used proportional class assignment and modified BCH bias-adjustment procedure with robust standard errors.

We first examined the direct effects of the relational trajectories on adolescent perceived romantic relationship quality (i.e., path *a* in Figure 1). Subsequently, we tested the direct effect of adolescent perceived romantic relationship on partner perceived romantic relationship quality (i.e., path *b* in Figure 1). Next, we examined the direct effects of the trajectory classes on partner perceived romantic relationship (i.e., path *c* in Figure 1). In the last step, we estimated the indirect effects of the trajectory classes on partner perceived relationship quality through adolescent perceived romantic relationship quality (i.e., path *a*b* in Figure 1).

Results

Research Aim I: Trajectories of Parent-Adolescent Relationship Quality

Solutions up to six latent profiles led to lower BIC and AIC-values, suggesting that each additional trajectory improved model fit. When examining the trajectories more specifically, the four-profile solution seemed to be the most meaningful and parsimonious. Specifically, the fifth-profile solution included a fifth trajectory which was very similar to one of the other profiles, whereas the third-profile solution showed a worse model fit than the five-profile solution and missed an unique trajectory that the four-profile solution did provide. Thus, the four-profile solution seemed to be the most theoretically relevant and parsimonious and therefore we selected it as our final model.

In line with our expectations, we found four relational trajectory profiles that were comparable to previous research on parent-adolescent relationships (e.g., Noack & Puschner, 1999) and parenting styles (Baumrind, 1991) using variables comparable to the key dimensions support and power. Those in the *authoritative relationship trajectory* (28% of the sample; 58% males) were supportive to each other, but parents in this relationship exerted much power to their adolescent children while children exerted little power to parents. Adolescents and parents in the *indulgent relationship trajectory* (26% of the sample; 46% males) provided much support to each other while parents exerted little power to the adolescent and adolescents exerted much power to parents. Those in the *distant trajectory* (33% of the sample; 57% males) initially provided little support to each other while parents exerted little power to the adolescent and adolescents exerted little power to parents. Finally, adolescents and parents in the *authoritarian trajectory* (13% of the sample; 51% males) were initially unsupportive of each other while parents exerted much power to their adolescent children and children exerted much power to parents. Table 2 shows the intercepts and linear slopes of each trajectory[7].

7 Table 1 of the supplemental material presents the means of relationship quality perceptions for each trajectory. Table 2 of the supplemental material provides the number of adolescents of each parent-adolescent relationship quality trajectory who are in a romantic relationship. This table also shows that adolescents in a turbulent relationship with parents are less likely to be in a relationship with the same romantic partner at the seventh and eight waves.

Table 2
Growth Factors of the Four Relational Trajectories

Growth factors	Adolescent reports on father		Adolescent reports on mother		Father reports on adolescent		Mother reports on adolescent	
	Support	Parental power	Support	Parental power	Support	Child power	Support	Child power
	M (SE)	*M (SE)*	*M (SE)*	*M (SE)*	*M (SE)*	*M (SE)*	*M (SE)*	*M (SE)*
Mean intercept								
Authoritative	2.63 (1.03)*[a]	4.12 (0.55)*[a]	3.65 (0.92)*[a]	3.22 (0.10)*[a]	2.98 (0.74)*[a]	1.68 (0.33)*[ab]	3.24 (0.61)*[a]	1.39 (0.04)*[a]
Indulgent	2.80 (0.98)*[b]	3.38 (0.55)*[b]	3.72 (0.90)*[a]	2.43 (0.06)*[b]	2.94 (0.71)*[a]	1.78 (0.33)*[b]	3.28 (0.60)*[a]	1.61 (0.05)*[b]
Distant	2.08 (1.04)*[c]	3.65 (0.57)*[c]	3.09 (0.97)*[b]	2.72(0.06)*[c]	2.50 (0.70)*[b]	1.66 (0.32)*[a]	2.94 (0.60)*[b]	1.40 (0.03)*[a]
Authoritarian	2.30 (1.11)*[c]	4.07 (0.58) *[a]	3.30 (1.05)*[ab]	3.04 (0.10)*[d]	2.61 (0.75)*[b]	1.83 (0.34)*[ab]	3.06 (0.63)*[b]	2.03 (0.05)*[c]
Mean linear slope								
Authoritative	-0.04 (0.01)*[a]	-0.06 (0.01)*[a]	-0.03 (0.01)*[ab]	-0.08 (0.02)*[a]	-0.02 (0.01)*[ab]	0.00 (0.01)[a]	-0.01 (0.01)[b]	-0.00 (0.00)[a]
Indulgent	-0.04 (0.01)*[a]	-0.06 (0.01)*[a]	-0.02 (0.01)[a]	-0.06 (0.01)*[a]	-0.01 (0.01)[b]	0.01 (0.01)*[a]	-0.01 (0.01)[b]	0.02 (0.01)*[a]
Distant	-0.06 (0.01)*[a]	-0.06 (0.01)*[a]	-0.03 (0.01)*[ab]	-0.08 (0.01)*[a]	-0.04 (0.01)*[a]	0.00 (0.01)[a]	-0.05 (0.01)*[a]	0.01 (0.00)[a]
Authoritarian	-0.08 (0.03)*[a]	-0.10 (0.02)*[a]	-0.06 (0.02)*[b]	-0.11 (0.02)*[a]	-0.02 (0.01)[ab]	0.01 (0.01)[a]	-0.03 (0.01)*[ab]	0.04 (0.01)*[b]

Note. Asterisks indicate a significant intercept or slope factor (p <.05). Same superscripts indicate that the intercept or slope parameter does not differ significantly from each other across the parent-adolescent relationship trajectories concerned (p <.05).

Regarding the intercept or the initial relationship quality, findings confirmed that both the authoritative and indulgent trajectories showed the most support in the relationship as perceived by adolescents and their parents. Both the authoritarian and distant trajectories showed the least support in the relationship as perceived by adolescents and their parents. Findings also confirmed that the authoritative and authoritarian trajectories included the most parental power in the relationship. This was particularly perceived by adolescents and not by their parents. Adolescents and parents from an indulgent and distant trajectory exerted little power to each other, with those in the indulgent trajectory perceiving the least parental power.

Concerning the slopes and growth rates, the four trajectories showed similar patterns of decreasing support and power over time, with slope parameters that did not differ significantly across trajectory classes. This indicates that the parent-adolescent relationship quality generally becomes less supportive and more egalitarian as adolescents grow older, irrespective of the trajectory class. Other than that, trajectories did not significantly differ in gender ($\chi^2(3, N = 759) = 7.77, p > 0.051$) or age ($F(3, 753) = 2.32, p = 0.074$).

Research Aim II: Trajectory Classes and the Quality of Romantic Relationships

We tested mediation models for the seventh and eight wave separately and found relatively comparable results between the waves. For this reason, we collapsed the relationship quality scores of the seventh and eight waves in the mediation models[8].

Table 3 displays the results of our mediation models using the mean relationship quality scores of the seventh and eight wave. We found a few significant main effects for gender and living situation. Concerning the gender effects, females reported more commitment and intimacy in their romantic relationship than males. Partners in a romantic relationship with female target adolescents perceived less support and more dominance in their relationship than partners who are in a romantic relationship with male target adolescents. Concerning the effects of living situation, adolescents who lived at home reported more supportive and committed romantic relationships. Romantic partners of these adolescents also reported more support in the relationship than partners of adolescents who moved out of home. Note, however, that adolescents living at home did significantly report less intimacy at the eight wave than at the seventh wave (see Table 3 of the supplemental material).

8 Table 3 of the supplemental material provide more detailed information about these results.

Table 3
Parent-Adolescent Relationship Effects on Romantic Relationships

	Romantic relationship dimensions				
	Support β *(SE)*	Power β *(SE)*	Intimacy β *(SE)*	Passion β *(SE)*	Commitment β *(SE)*
Effects of control variables					
1. Gender on adolescent perceived quality	0.04 (0.02)	-0.07 (0.03)*	0.05 (0.02)*	-0.01 (0.03)	0.17 (0.04)*
2. Gender on partner perceived quality	-0.04 (0.03)*	0.11 (0.03)*	-0.01 (0.03)	0.04 (0.03)	-0.00 (0.03)
1. Living situation on adolescent perceived quality	0.07 (0.03)*	0.05 (0.03)	0.03 (0.03)	0.04 (0.03)	0.08 (0.03)*
2. Living situation on partner perceived quality	0.06 (0.03)*	0.05 (0.03)	0.01 (0.03)	0.00 (0.03)	0.06 (0.03)
1. Romantic relationship duration on adolescent perceived quality	0.00 (0.00)*	0.00 (0.00)	0.00 (0.00)*	-0.00 (0.00)*	0.00 (0.00)*
2. Romantic relationship duration on partner perceived quality	-0.00 (0.00)	0.00 (0.00)*	0.00 (0.00)	-0.00 (0.00)*	0.00 (0.00)*
A. Parent-adolescent relationship trajectories on adolescent perceived quality					
Wald test multivariate effects	23.12*	8.10*	18.12*	15.43*	4.87
1. Authoritative	0.14 (0.04)^{a}	0.06 (0.05)^{a}	0.07 (0.04)^{a}	0.09 (0.04)^{ab}	0.11 (0.05)^{a}
2. Indulgent	0.07 (0.04)^{ab}	-0.12 (0.05)^{b}	0.12 (0.04)^{a}	0.10 (0.04)^{ab}	-0.05 (0.05)^{b}
3. Distant	-0.13 (0.04)^{c}	-0.01(0.04)^{a}	-0.09 (0.04)^{b}	-0.12 (0.04)^{c}	0.00 (0.05)^{ab}
4. Authoritarian	-0.08 (0.05)^{bc}	0.07 (0.06)^{a}	-0.09 (0.05)^{b}	-0.07 (0.06)^{ac}	-0.05 (0.07)^{ab}
B. Adolescent perceived quality on partner perceived quality	0.35 (0.05)*	0.01 (0.05)	0.40 (0.05)*	0.34 (0.04)*	0.47 (0.04)*
C. Parent-adolescent relationship trajectories on partner perceived quality					
Wald test multivariate effects	0.35	4.68	1.88	4.45	3.44
1. Authoritative	0.02 (0.04)^{a}	-0.07 (0.04)^{a}	0.03 (0.04)^{a}	0.07 (0.04)^{a}	0.04 (0.04)^{a}
2. Indulgent	-0.00 (0.04)^{a}	-0.05 (0.04)^{a}	-0.03 (0.04)^{a}	-0.02 (0.04)^{a}	-0.06 (0.04)^{a}
3. Distant	0.02 (0.04)^{a}	0.04 (0.04)^{a}	0.04 (0.04)^{a}	0.02 (0.04)^{a}	-0.02 (0.04)^{a}
4. Authoritarian	-0.03 (0.05^{a}	0.09 (0.06)^{a}	-0.04 (0.06)^{a}	-0.07 (0.05)^{a}	0.04 (0.05)^{a}
A*B. Indirect effects of parent-adolescent relationship trajectories					
Wald test multivariate effects	14.55*	0.04	12.84*	11.45*	4.61
1. Authoritative à adolescent perceptions à partner perceptions	0.05 (0.02)^{a}	0.02 (0.00)^{a}	0.03 (0.02)^{a}	0.03 (0.02)^{a}	0.04 (0.02)^{a}
2. Indulgent à adolescent perceptions à partner perceptions	0.03 (0.01)^{ab}	-0.04 (0.01)^{a}	0.04 (0.02)^{ab}	0.04 (0.02)^{ab}	-0.02 (0.02)^{b}
3. Distant à adolescent perceptions à partner perceptions	-0.05 (0.01)^{c}	-0.01 (0.00)^{a}	-0.03 (0.02)^{c}	-0.04 (0.01)^{c}	0.00 (0.02)^{ab}
4. Authoritarian à adolescent perceptions à partner perceptions	-0.03 (0.02)^{b}	0.03 (0.00)^{a}	-0.04 (0.02)^{a}	-0.03 (0.02)^{b}	-0.02 (0.02)^{ab}

Note. We compared pairs of relational trajectories to each other using the tests reported by the program Latent Gold version 5.1. Same superscripts indicate no significant differences among the trajectory classes concerned. Asterisks indicate a significant overall effect ($p < .05$). We used effect coding in gender (i.e., females) and living situation (i.e, living with family) variables.

Parent-adolescent relationships on adolescent perceived relationship. Findings generally confirmed that adolescents in an authoritative relationship quality with parents reported the most adjusted romantic relationship quality. Specifically, adolescents in an authoritative or an indulgent relationship quality with parents perceived the most support and intimacy in their romantic relationship. Thereby, adolescents in an authoritative relationship quality with parents reported more commitment to their romantic partner when compared to those in an indulgent relationship quality with parents. Adolescents in an authoritative relationship with parents thus seem to be slightly better adjusted than those in an indulgent relationship with parents. In contrast, adolescents in a turbulent and distant relationship quality with parents perceived less support and intimacy in their romantic relationship than those in an authoritative or indulgent relationship quality with parents. Adolescents in a distant relationship quality with parents also perceived less passion in their romantic relationship than those in the other trajectories.

Linkages between adolescent and partner perceived relationship. Findings revealed that partner perceptions on relationship was related to adolescents' actual perceptions on relationship. Adolescents' perceptions on support, intimacy, passion, and own commitment significantly predicted their partners' perceptions on these relational variables. Thus, those who perceived high levels of support intimacy, and passion, and reported more commitment in their romantic relationship, also had a partner who experienced high levels of these relational aspects from them.

Parent-adolescent relationships on partners' perceived relationship. Adolescents' relationship with their parents does not directly affect their romantic partners' perceptions on relationship. We generally found no significant differences between the direct effects of the trajectories on partners' relationship perceptions.

Indirect effects of parent-adolescent relationships on partner perceived relationship

An authoritative relationship quality with parents was systematically the most adaptive. First, partners of adolescents experiencing an authoritative relationship quality with parents perceived more support and passion in their romantic relationship when compared to partners of adolescents in an authoritarian and distant relationship quality with parents. They also perceived more intimacy in their romantic relationship when compared to partners of adolescents in a distant relationship quality with parents. Importantly, these differences were only significant in an indirect way, such that they only emerged through target adolescent perceived support, intimacy, and passion in the romantic relationship.

Second, partners of adolescents in an indulgent relationship quality with parents were similar to partners of adolescents in an authoritarian relationship quality with parents in their perceptions of support, intimacy, and passion in romantic relationship through adolescent perceived relationship. However, partners of adolescents in an authoritative relationship quality with parents perceived more commitment, through adolescent perceived commitment, than adolescents in an indulgent relationship with parents. Thus, partners of adolescents in an authoritative relationship quality with parents slightly experienced a better-adjusted romantic relationship than partners of adolescents in an indulgent relationship quality with parents. However, partners of adolescents in a distant relationship quality with parents seem to be the least adjusted. Partners of adolescents in such relationships perceived low levels of support, intimacy, and passion in their relationship as target adolescents perceived low levels on these relational aspects as well.

Discussion

The current study used multi-dimensional perspectives from multiple family members on parent-adolescent relationships to predict young adults' as well as their partners' perceptions of romantic relationship quality. To do so, this study used an eight-wave longitudinal multi-informant design. Results revealed four trajectories reflecting parent-adolescent relationship quality development as reported by adolescents themselves and their parents. Of these trajectories, an authoritative relationship with parents predicted the highest romantic relationship quality as perceived by adolescents as well as their romantic partners. In contrast, a distant relationship with parents related to the worst romantic relationship quality as perceived by adolescents as well as their romantic partners. We discuss these findings in detail below.

Individual Differences in Parent-Adolescent Relationship Quality Trajectories

Based on the family systems perspective (Bowen, 1974), we generated parent-adolescent relationship quality profiles while accounting for multiple perspectives on, and the multidimensional nature of these relationships. Specifically, we used adolescent, maternal, and parental reports on the key relational aspects support and power. We identified authoritative, indulgent, distant, and authoritarian parent-adolescent relationship trajectories. These profiles are comparable to the typologies identified in previous studies on adolescent relationships (Noack & Puschner, 1999) and parenting styles (Baumrind, 1991). Interestingly, our multi-informant data lead to comparable parent-adolescent relationship quality profiles as studies that used single informant data. This might relate to the interdependence perspective (Kelley et al., 2003), which proposes that individual perceptions in a relationship positively correlate to each other. Adolescent and parental

reports on relationship quality would therefore be similar to each other, and combining these reports as well as using either adolescent or parental reports only could then lead to comparable relationship quality profiles. Our typology provides empirical evidence for this assertion and summarizes longitudinal multidimensional and multi-informant data on parent-adolescent relationships in a parsimonious way.

Two findings concerning our typology needs warrant. First, although some adolescents and parents remained to perceive more or less support and/or autonomy in their relationships when compared to others, they all generally experienced decreasing support and autonomy in their relationship over time. These findings are in line with literature that indicated a universal decline in adolescent perceived support and/or autonomy in parent-adolescent relationships (e.g., Darling, Cumsille, & Pena-Alampay, 2005; De Goede et al., 2009). Unlike previous studies, however, we used multi-informant data to identify relationship quality trajectories and demonstrated that each member of the family system generally perceived a decrease in support and autonomy across adolescence. Our study thus replicated previous findings, albeit in a more comprehensive design that accounts for each individual's perceptions within the parent-adolescent relationship system. Thereby, our findings further validate the use of person-centered approaches in relationship development (e.g., Hadiwijaya et al., 2017; Laursen & Hoff, 2006; Seiffge-Krenke et al., 2010).

Second, our findings add to the accumulating evidence of heterogeneity in parent-adolescent relationship quality types (e.g., Hadiwijaya et al., 2017; Hollenstein & Lougheed, 2013). In our study, there was no domineering parent-adolescent relationship type. Around a quarter percent of the adolescents had an authoritative relationship with their parents and another quarter percent had an indulgent relationship with their parents. One-third of the adolescents had a distant relationship with their parents and one-tenth of the adolescents had an authoritarian relationship with their parents. The large numbers of adolescents in the latter two relationship types are concerning as adolescents in unsupportive relationships are more susceptible for poor developmental outcomes such as lower levels of self-worth and higher levels of aggressiveness and depressive mood (e.g., Laursen et al., 2006; Noack & Puschner, 1999).

Parent-Adolescent Relationship Quality to Adolescent Perceived Relationship

In line with attachment (Bowlby, 1978) and social cognitive (Bandura, 1977) theory, we also provided evidence for a continuity from supportive parent-adolescent relationships into supportive romantic relationships. We revealed that adolescents in an authoritative or an indulgent relationship with parents perceived systematically higher levels of both support and intimacy in the relationship with romantic partner when compared to adolescents in a distant or authoritarian relationship with parents. Our findings conform

to previous variable-centered and person-centered studies which demonstrated that adolescents who are in a supportive relationship with parents have supportive romantic relationships as well (e.g., Walper & Wendt, 2015). Also, our findings add to previous studies by revealing that not all adolescents, but particularly those in an authoritative or an indulgent relationship with parents perceived supportive and intimate romantic relationships. Note that those in an authoritative relationship with parents are slightly better adjusted, as these adolescents perceived more commitment in their romantic relationship when compared to adolescents in an indulgent relationship with parents.

Partly in line with the attachment (Bowlby, 1978) and social cognitive (Bandura, 1977) perspectives, we identified some continuity from hierarchical parent-adolescent relationships into adolescents' perceived hierarchical romantic relationships. Adolescents in an authoritative and authoritarian relationship with parents perceived more dominance from their romantic partner when compared to those in an indulgent and a distant relationship with parents. In addition, adolescents in an indulgent relationship with parents perceived less dominance from their romantic partner when compared to those in an authoritative, authoritarian, and distant relationship with parents.

In contrast to the attachment (Bowlby, 1978) and social cognitive (Bandura, 1977) perspectives, adolescents in a distant relationship with their parents did not perceive low, but normative levels of dominance from their romantic partner. More specifically, adolescents in a distant relationship with parents perceived similar levels of dominance from romantic partners as compared to adolescents in authoritative and authoritarian relationships with parents. Altogether, our findings refine insights in the attachment and social cognitive perspectives on adolescent relationship continuity by showing that equity in parent-adolescent relationships is passed on romantic relationships only if the relationship with parents is also supportive (e.g., indulgent relationship).

Indirect Effects of Parent-Adolescent Relationships on Partner Perceived Relationship

We found evidence for parent-adolescent relationships affecting adolescent experiences on romantic relationships and that this consequently affected romantic partner experiences on their relationship. First, adolescents in a supportive relationship with parents (i.e., authoritative and indulgent relationships) have partners that also perceived their romantic relationship as supportive, intimate, and passionate while target adolescents also perceived their relationship as such. Although both authoritative and indulgent relationships are adaptive, particularly partners of adolescents in an authoritative relationship with parents perceived more committed romantic relationships and were better adjusted than partners of adolescents in an authoritarian relationship with parents. This finding relates to parenting research, in which an authoritative style of parenting is

often linked with positive outcomes (e.g., Driscoll, Russell, & Crockett, 2008; Fletcher, Darling, Steinberg, & Dornbusch, 1995). The parent-adolescent relationship system might be shaped by certain parenting styles, with the authoritative parenting style potentially leading to a relationship quality profile indicating an authoritative parent-adolescent relationship. Overall, our findings highlight the importance of authoritative parent-adolescent relationships for satisfactory romantic relationships.

Second, an uninvolved relationship with parents (i.e., distant relationship) predicted low levels of support, intimacy, and passion in the romantic relationship as perceived by adolescents and their partners. It is remarkable that particularly adolescents with a distant parent-adolescent relationship and not also those with an authoritarian parent-adolescent relationship are susceptible for poor romantic relationships. One explanation for this is that an authoritarian relationship with parents might reflect a temporarily disrupted family system that eventually improves in young adulthood (e.g., De Goede et al., 2009; Hadiwijaya et al., 2017). A distant relationship with parents might reflect a continuously poor family system. For example, a distant parent-adolescent relationship might stem from neglectful parenting and/or parent-child attachment. Thereby, neglected parenting and/or parent-child attachment are often linked to maladaptive outcomes (e.g., Mustillo, Dorsey, Conover, & Burns, 2011; Schroeder, Bulanda, Giordano, & Cernkovich, 2010). Altogether, our findings shed light on the potential problems that adolescents in distant family systems could have in romantic relationships. Practitioners should bear this in mind when working with adolescents in a distant and uninvolved family system, as these adolescents are susceptible for experiencing continuous interpersonal problems.

Lastly, the lack of a direct effect from parent-adolescent relationships on the romantic partner's relationship perceptions underscore the far-reaching, yet limited influences of parent-adolescent relationship quality on romantic partner relationship experiences. We mainly found that parent-adolescent relationship quality influences reach far until young adulthood and into adolescents' as well as their romantic partners' relationship quality perceptions, but that the latter effect only emerged if target adolescents' own relationship perceptions are considered. Romantic partners' relationship perceptions may be more directly linked to their own system of relationship with parents, instead of target adolescent relationship with parents. Although the absence of direct effects are relatively uncommon in mediation models, it remains possible for a mediator variable (i.e., adolescent relationship perceptions) to be causal between the independent (i.e., parent-adolescent relationships) and dependent (i.e., romantic partner perceptions) variables (Hayes, 2009). In such cases, the term mediator could be best avoided since there is no direct effect from the independent and dependent variables. Instead, it might be more fitting to refer simply to indirect effects (e.g., Hayes, 2009; Mathieu & Taylor,

2006). Such a statistical phenomenon seems apt to our findings that demonstrated the indirect influences of parent-adolescent relationships on romantic partners' experiences of relationship quality.

Study Limitations

The first limitation is that we did not apply a person-centered approach to explore romantic partner relationship quality. We did not produce profiles using constellations of support and power as perceived by adolescents and/or as perceived by romantic partner. This could have better captured the multidimensional and multi-informant nature of romantic relationships. However, applying latent profile analyses to our relatively small samples of adolescent with romantic partners as well as their romantic partners would almost inevitably lead to small numbers of participants within each profile. Combining adolescent and partner perceived relationship profiles may have led to low cell-counts likely causing a further loss of predictive power. Therefore, we decided not to produce profiles for romantic partner relationship quality. Nevertheless, we strongly encourage applying person-centered approaches when examining the multidimensional and multi-informant nature of relationships if the sample size allows so.

A second limitation is that we lacked the siblings' perspective on the target adolescents' relationship with parents. The family system often also include siblings as a family member (Bowen, 1974). The addition of the siblings' perspective could provide a comprehensive understanding of the family context as perceived by all members of the family. Despite this, the inclusion of adolescent and parent perspectives on relationship quality in one and same design provides a meaningful starting point to illustrate the merits of a multi-informant person-centered approach for the parent-adolescent relationship system. Research has also indicate that adolescent and parental influences are particularly important as parent-child relationships account for more variance in romantic relationship quality than either sibling relationships or parent's marital relationships (e.g., Collins et al., 2009; Conger et al., 2000). Nevertheless, further research should further explore family systems using the perspectives of all members on all dyadic relationships within the system.

A third limitation is that we only covered romantic relationships in young adulthood (i.e., 20 and 22; 21 and 23). This offers a limited understanding of young adults' relationships as such relationships develop with age. For instance, in our study we revealed that those who lived with their family have more supportive romantic relationships than those who lived independently. However, we also revealed that those who lived with their family perceived less intimacy at the age of 22/23, but not at the age of 20/21. These findings imply that living with family can be slightly less adaptive for romantic relationships once young adults grow older. Especially the evolutionary perspective (Steinberg,

1989) emphasizes the importance of young adults' independency from parents for their romantic and sexual development. Young adults who live with their family could face challenges such as having too little private time together with their romantic partner and parents that are too involved in their adult children's activities. Consequently, these challenges can cause fractions in their romantic relationships. Future studies should examine whether the quality of romantic relationships worsens when adolescents remain to live with parents across the period of adolescence and adulthood.

Conclusion

Our study accounted for the multidimensional and multi-source nature of parent-adolescent relationships in examining the influences of this relationship on later romantic relationship quality. We revealed that parent-adolescent relationships shape adolescents' perceptions on romantic relationships and that this consequently shaped their partners' perceptions on their romantic relationship. Supportive and hierarchical parent-adolescent relationships relate to supportive, intimate, and committed romantic relationships, whereas unsupportive and uninvolved parent-adolescent relationships relate to poor romantic relationships. Altogether, the quality of the parent-adolescent relationship system affects the likelihood of individuals developing an adaptive romantic relationship in early adulthood.

Supplementary material

Missing data across waves

Across all waves, approximately 15.5% of adolescents' reports on the relationship quality with their fathers and mothers were missing per subscale. Approximately 15.5% of maternal and 22.0% of paternal reports on the relationship with their adolescent child were missing across waves per subscale. Adolescent and parents who did not partake at the sixth wave generally did not significantly differ on their reported relationship quality at the first wave from those that completed the data collection ($p < .05$). The only difference was that fathers who were missing reported less parental power, whereas mothers who were missing at the sixth wave reported more parental power. In addition, Little's (1988) Missing Completely at Random test indicated that all data were likely missing at random ($\chi 2/df = 1.07$; Bollen, 1989). These findings thus imply that participants with missing data were comparable to those with complete data.

Table 1
Means of Relationship Quality Perceptions for Each Parent-Adolescent Relationship Trajectory

		Authoritative *M* (*SD*)	Indulgent *M* (*SD*)	Distant *M* (*SD*)	Authoritarian *M* (*SD*)	Total *M* (*SD*)
		Adolescent and parental reports from age 13 to 18				
Support						
	Adolescent reports on father	3.63 (0.42)^{a1}	3.79 (0.38)^{a1}	3.04 (0.45)^{a1}	3.20 (0.50)^{a1}	3.42 (0.53)
	Father reports on adolescents	3.38 (0.32)^{b1}	3.36 (0.33)^{b1}	2.88 (0.36)^{b1}	3.04 (0.32)^{b1}	3.16 (0.41)
	Adolescent reports on mother	3.91 (0.36)^{a2}	4.02 (0.32)^{a2}	3.34 (0.40)^{a2}	3.44 (0.48)^{a2}	3.69 (0.49)
	Mother reports on adolescents	3.52 (0.33)^{b2}	3.56 (0.34)^{b2}	3.14 (0.36)^{b2}	3.30 (0.38)^{b2}	3.38 (0.39)
Power						
	Adolescent reports on father	3.01 (0.47)^{a1}	2.24 (0.37)^{a1}	2.52 (0.50)^{a1}	2.86 (0.56)^{a1}	2.63 (0.56)
	Father reports on adolescents	3.61 (0.21)^{b1}	3.36 (0.27)^{b1}	3.36 (0.21)^{b1}	2.84 (0.28)^{b1}	3.30 (0.35)
	Adolescent reports on mother	3.07 (0.41)^{a1}	2.28 (0.38)^{a1}	2.53 (0.44)^{a1}	2.79 (0.56)^{a1}	2.65 (0.53)
	Mother reports on adolescents	3.35 (0.33)^{b2}	3.21 (0.37)^{a2}	3.37 (0.32)^{b2}	3.19 (0.36)^{a2}	3.44 (0.34)
		Adolescent and romantic partner reports from age 20-21 and 22-23				
Support						
	Adolescent reports on romantic partner	3.98 (0.47)^{a}	3.90 (0.46)^{a}	3.73 (0.47)^{a}	3.73 (0.48)^{a}	3.85 (0.48)
	Romantic partner reports on adolescent	3.83 (0.48)^{b}	3.78 (0.55)^{b}	3.72 (0.43)^{a}	3.67 (0.42)^{a}	3.77 (0.48)
Power						
	Adolescent reports on romantic partner	2.19 (0.48)^{a}	2.01 (0.58)^{a}	2.10 (0.59)^{a}	2.15 (0.55)^{a}	2.11 (0.55)
	Romantic partner reports on adolescent	2.13 (0.52)^{a}	2.17 (0.47)^{a}	2.23 (0.57)^{a}	2.26 (0.51)^{a}	2.19 (0.52)
Intimacy						
	Adolescent reports on romantic partner	4.40 (0.43)^{a}	4.45 (0.39)^{a}	4.26 (0.51)^{a}	4.23 (0.48)^{a}	4.35 (0.46)
	Romantic partner reports on adolescent	4.38 (0.45)^{a}	4.31 (0.50)^{b}	4.33 (0.48)^{a}	4.24 (0.52)^{a}	4.33 (0.48)
Passion						
	Adolescent reports on romantic partner	4.31 (0.48)^{a}	4.33 (0.47)^{a}	4.11 (0.58)^{a}	4.18 (0.48)^{a}	4.24 (0.52)
	Romantic partner reports on adolescent	4.34 (0.45)^{a}	4.28 (0.46)^{a}	4.23 (0.43)^{b}	4.22 (0.56)^{a}	4.28 (0.46)
Commitment						
	Adolescent reports on romantic partner	4.00 (0.57)^{a}	3.86 (0.60)^{a}	3.92 (0.63)^{a}	3.86 (0.68)^{a}	3.92 (0.61)
	Romantic partner reports on adolescent	4.10 (0.53)^{a}	3.93 (0.54)^{a}	4.00 (0.50)^{a}	4.00 (0.59)^{a}	4.02 (0.54)

Note. Different alphabetic superscripts indicate significantly different perspectives on relationship quality among adolescent and their parent or adolescent and their romantic partner (p <.05). In contrast, different numeric superscripts indicate significantly different perspectives on relationship between adolescent reports on father and mother and between paternal and maternal reports on adolescent (p <.05). Note that we reverse coded the father and mother reports on adolescent power to simplify the interpretation for the readers.

Table 2
Comparisons of Romantic Relationship Stability Across the Seventh and Eight Waves

	Authoritative	Indulgent	Distant	Turbulent
Reported similar partner	27[a]	26[a]	32[a]	2[b]
Reported having no partner	217[a]	191[a]	251[a]	100[a]
Reported a partner or a different partner	89[a]	78[a]	81[a]	39[a]

Note. Chi-square tests shows overall differences in romantic relationship stability among the parent-adolescent relationship trajectories ($\chi^2(6, N = 759) = 16.25$, $p > 0.012$). Different superscripts indicate significant differences among the relationship trajectories.

Table 3
Parent-Adolescent Relationship Effects on Romantic Relationships at the Seventh and Eight Wave

	Seventh wave				
	Romantic relationship dimensions				
	Support	Power	Intimacy	Passion	Commitment
	β *(SE)*	β *(SE)*	β *(SE)*	β *(SE)*	β *(SE)*
Effects of control variables					
3. Gender on adolescent perceived quality	0.06 (0.03)	-0.08 (0.04)*	0.07 (0.03)*	0.01 (0.04)	0.18 (0.04)*
4. Gender on partner perceived quality	0.05 (0.03)	0.11 (0.03)*	0.04 (0.03)*	0.07 (0.03)*	0.00 (0.03)
3. Living situation on adolescent perceived quality	0.08 (0.04)*	0.07 (0.04)	0.02 (0.03)	0.01 (0.04)	0.06 (0.04)
4. Living situation on partner perceived quality	0.07 (0.03)*	0.08 (0.04)*	0.04 (0.04)	0.03 (0.03)	0.05 (0.04)
1. Romantic relationship duration on adolescent perceived quality	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)*	0.00 (0.00)
2. Romantic relationship duration on partner perceived quality	0.00 (0.00)	0.00 (0.00)*	0.00 (0.00)	-0.01 (0.00)*	0.01 (0.00)
A. Parent-adolescent relationship trajectories on adolescent perceived quality					
Wald test multivariate effects	18.96*	11.81*	13.61*	11.11*	8.07*
5. Authoritative	0.15 (0.05)[a]	0.15 (0.06)[a]	0.10 (0.05)[a]	0.16 (0.06)[a]	0.14 (0.06)[a]
6. Indulgent	0.12 (0.05)[a]	-0.16 (0.06)[b]	0.14 (0.05)[a]	0.03 (0.06)[ab]	0.02 (0.06)[ab]
7. Distant	-0.13 (0.05)[b]	-0.01 (0.05)[ab]	-0.05 (0.05)[ab]	-0.12 (0.05)[b]	0.05 (0.06)[ac]
8. Authoritarian	-0.14 (0.07)[c]	0.02 (0.08)[ab]	-0.19 (0.07)[b]	-0.06 (0.07)[ab]	-0.21 (0.08)[c]
B. Adolescent perceived quality on partner perceived quality	0.27 (0.06)*	-0.04 (0.06)	0.26 (0.06)*	0.30 (0.05)*	0.38 (0.05)*
C. Parent-adolescent relationship trajectories on partner perceived quality					
Wald test multivariate effects	4.23	1.83*	1.96	1.04*	2.96*
1. Authoritative	-0.05 (0.05)[a]	-0.05 (0.05)[a]	-0.03 (0.05)[a]	0.05 (0.05)[a]	-0.05 (0.05)[a]
2. Indulgent	0.07 (0.05)[a]	-0.04 (0.06)[a]	0.01 (0.06)[a]	-0.03 (0.05)[a]	0.04 (0.05)[a]
3. Distant	0.06 (0.05)[a]	0.05 (0.05)[a]	0.07 (0.05)[a]	-0.01 (0.05)[a]	0.06 (0.05)[a]
4. Authoritarian	-0.08 (0.07)[a]	0.04 (0.07)[a]	-0.05 (0.07)[a]	-0.01 (0.07)[a]	-0.05 (0.07)[a]
A*B. Indirect effects of parent-adolescent relationship trajectories					
Wald test multivariate effects	8.65*	0.34	6.70	7.42	6.60
1. Authoritative à adolescent perceptions à partner perceptions	0.04 (0.02)[a]	0.04 (0.01)[a]	0.03 (0.02)[a]	0.04 (0.02)[a]	0.04 (0.02)[a]
2. Indulgent à adolescent perceptions à partner perceptions	0.03 (0.02)[ab]	-0.04 (0.01)[a]	0.04 (0.02)[a]	0.01 (0.02)[ab]	0.00 (0.02)[ab]
3. Distant à adolescent perceptions à partner perceptions	-0.04 (0.02)[c]	0.00 (0.00)[a]	-0.01 (0.01)[a]	-0.03 (0.02)[b]	0.01 (0.02)[ab]
4. Authoritarian à adolescent perceptions à partner perceptions	-0.04 (0.02)[d]	0.01 (0.01)[a]	-0.05 (0.02)[b]	-0.02 (0.02)[ab]	-0.06 (0.02)[b]

	Eight wave				
	Romantic relationship dimensions				
	Support	Power	Intimacy	Passion	Commitment
	β *(SE)*	β *(SE)*	β *(SE)*	β *(SE)*	β *(SE)*
Effects of control variables					
1. Gender on adolescent perceived quality	0.01 (0.03)	-0.09 (0.03)*	0.02 (0.03)	-0.04 (0.03)	0.13 (0.04)*
2. Gender on partner perceived quality	0.01 (0.03)	0.13 (0.03)*	-0.02 (0.03)	0.04 (0.03)	-0.00 (0.04)
1. Living situation on adolescent perceived quality	-0.03 (0.03)	0.01 (0.04)	-0.08 (0.03)*	-0.03 (0.03)	0.03 (0.04)
2. Living situation on partner perceived quality	0.03 (0.03)	0.04 (0.04)	-0.05 (0.03)	0.02 (0.03)	0.11 (0.04)*
1. Romantic relationship duration on adolescent perceived quality	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)*	0.00 (0.00)
2. Romantic relationship duration on partner perceived quality	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.01 (0.00)*	0.00 (0.00)
A. Parent-adolescent relationship trajectories on adolescent perceived quality					
Wald test multivariate effects	18.65*	1.59	13.39*	8.28*	8.50*
1. Authoritative	0.15 (0.05)[a]	0.04 (0.06)[a]	0.06 (0.05)[a]	0.06 (0.06)[ab]	0.04 (0.07)[a]
2. Indulgent	0.03 (0.05)[a]	-0.05 (0.05)[a]	0.09 (0.04)[a]	0.11 (0.05)[ab]	-0.14 (0.06)[ab]
3. Distant	-0.15 (0.04)[b]	-0.03 (0.05)[a]	-0.14 (0.04)[b]	-0.10 (0.05)[a]	-0.10 (0.06)[ac]
4. Authoritarian	-0.04 (0.07)[ab]	0.03 (0.08)[a]	-0.01 (0.07)[ab]	-0.06 (0.07)[ab]	0.20 (0.10)[c]
B. Adolescent perceived quality on partner perceived quality	0.40 (0.05)*	0.04 (0.06)	0.43 (0.06)*	0.39 (0.05)*	0.53 (0.04)*
C. Parent-adolescent relationship trajectories on partner perceived quality					
Wald test multivariate effects	2.71	3.05	4.61	4.09	9.29*
1. Authoritative	0.06 (0.04)[a]	-0.07 (0.06)[a]	0.08 (0.05)[a]	0.07 (0.05)[a]	0.11 (0.05)[a]
2. Indulgent	-0.03 (0.04)[a]	-0.05 (0.06)[a]	-0.03 (0.04)[a]	0.01 (0.05)[a]	-0.11 (0.05)[b]
3. Distant	-0.03 (0.04)[a]	0.05 (0.06)[a]	0.03 (0.05)[a]	0.04 (0.05)[a]	-0.05 (0.05)[b]
4. Authoritarian	0.00 (0.06)[a]	0.08 (0.06)[a]	-0.09 (0.07)[a]	-0.12 (0.07)[a]	0.05 (0.08)[ab]
A*B. Indirect effects of parent-adolescent relationship trajectories					
Wald test multivariate effects	13.07*	0.28	10.04*	6.77	8.10*
1. Authoritative à adolescent perceptions à partner perceptions	0.06 (0.02)[a]	0.02 (0.01)[a]	0.02 (0.02)[a]	0.02 (0.02)[a]	0.02 (0.04)[ab]
2. Indulgent à adolescent perceptions à partner perceptions	0.01 (0.02)[a]	-0.02 (0.00)[a]	0.03 (0.02)[a]	0.04 (0.02)[ab]	-0.06 (0.03)[ab]
3. Distant à adolescent perceptions à partner perceptions	-0.06 (0.02)[b]	-0.01 (0.00)[a]	-0.06 (0.02)[b]	-0.04 (0.02)[a]	-0.04 (0.03)[a]
4. Authoritarian à adolescent perceptions à partner perceptions	-0.01(0.03)[a]	0.01 (0.01)[a]	0.00 (0.03)[a]	-0.03 (0.03)[ab]	0.08 (0.05)[ab]

Note. We compared pairs of relational trajectories to each other using the tests reported by the program Latent Gold version 5.1. Same superscripts indicate no significant differences among the trajectory classes concerned. Asterisks indicate a significant overall effect ($p < .05$). We used effect coding in gender (i.e., females) and living situation (i.e, living with family) variables. As shown in the tables, many direct and indirect effects were non-significantly different between the waves ($p < .05$). The few significant differences that emerged mainly related to the relational aspects of intimacy and commitment. First, adolescents living at home significantly reported less intimacy at the eight wave than at the seventh wave. Second, there were stronger associations between adolescent and partner perceived intimacy and commitment at the eight wave than at the seventh wave. Third, an authoritative relationship with parents showed a more positive direct effect and an indulgent relationship showed a more negative direct effect on partner perceived commitment at the eight wave than at the seventh wave. Finally, an authoritarian relationship with parents significantly related to more partner perceived commitment, through adolescent perceived commitment, at the eight wave than at the seventh wave. Additionally, a distant relationship with parents significantly related to less partner perceived intimacy, through adolescent perceived intimacy, at the eight wave than at the seventh wave

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Chapter 6

Summary and general discussion

Numerous studies demonstrated the developmental patterns of adolescent relationship with parents as well as the influences of adolescent relationship with parents on other social relationships. Most of these studies, however, ignored the multidimensional nature of adolescents' relationships while the quality of relationships can only be fully understood if combinations of multiple dimensions are considered (e.g., Laursen & Hoff, 2006). These studies further failed to capture the potential individual differences that occur in various relationship types, whereas the existence of such differences seems obvious (e.g., Arnett, 1999; Hollenstein & Lougheed, 2013). Person-centered approaches can address these issues by producing relational quality profiles (e.g., Laursen et al., 2006; Laursen & Hoff, 2006). Until now, few studies have examined adolescents' relationship development with parents using a person-centered approach.

The current thesis tackled this shortcoming in two ways. First, this thesis focused on individual differences in adolescent relationship quality development with parents. We examined this by generating a parent-adolescent relationship quality typology using multiple relational dimensions (i.e., power, support, and negative interactions). Second, this thesis addressed individual differences in how adolescent relationship quality with parents continues into their friendships and romantic relationships. We investigated this by applying a person-centered approach. Doing so, we identified adolescents with distinct types of parent-adolescent relationship quality and demonstrated that adolescents with different types of relationship with their parents also experience different types of friendship and romantic relationship quality.

Summary of the Main Findings

In this section, we provide a short summary of the main findings of each chapter. In the first part of this section, we focus on the individual differences in adolescent relationship quality development with parents (i.e., chapters two and three). In the second part of this section, we focus on individual differences in how adolescent relationship quality with parents continues into their friendships and romantic relationships (i.e., chapters four and five).

Individual differences in adolescent relationship quality with parents

We produced a reliable and valid parent-adolescent relationship quality typology in **the second chapter**. Specifically, we identified harmonious, average, authoritarian, and detached parent-adolescent relationship profiles. We replicated these types in a subsample and demonstrated the external validity of these types as they systematically linked to psychopathology and personality. Individuals with a harmonious relationship with their parents displayed the least psychopathology symptoms and the best-adjusted

personality profile, whereas adolescents with a turbulent relationship with their parents displayed the most psychopathology symptoms and least-adjusted personality profile. In this chapter, we also compared the value of an adjusted person-centered approach to the standard approach to tackle the low predictive power of person-centered approaches. Thereby, the adjusted person-centered approach took potential classification errors into account, whereas the standard approach did not. Results showed that the adjusted person-centered approach explained almost twice as much variance than the unadjusted standard approach by accounting for classification errors. Thus, this study underscores the importance of identifying heterogeneity in relationship quality as there are clearly distinct types of parent-adolescent relationships among individuals.

In the **third chapter,** we examined typical and atypical patterns of parent-adolescent relationship development. For this purpose, parent-adolescent relationship quality profiles were produced, and change and stability patterns of each of these relational profiles were examined. We identified harmonious, authoritative, uninvolved-discordant, and turbulent parent-adolescent relationship profiles that partly overlapped with our prior relationship typology from Chapter Two. Between ages 12 to 16 years, there was a trend of adolescents moving away from an authoritative relationship with their parents and changing into an uninvolved-discordant or turbulent relationship. However, some adolescents continued to perceive the relationship with their parents as authoritative and some adolescents changed to perceive the relationship with their parents as harmonious. From ages 16 to 20 years, a majority of adolescents changed to perceive the relationship with their parents as harmonious. Some adolescents, however, continued to perceive the relationship with their parents as uninvolved-discordant or turbulent. Overall, these findings showed that *(a)* only a minority of adolescents experienced distress in the relationship with parents in early adolescence and (b) that some adolescents that initially experienced distress in their relationship with parents improved their relationships in late adolescence.

Continuity of parent-adolescent relationship quality to best friend and romantic relationship quality

We investigated the extent to which the relationship quality with parents spills over into, or compensates for, the relationship quality with best friend in normative and anxious adolescents in the **fourth chapter**. Results showed harmonious, turbulent, average, friend-oriented and parent-oriented profiles that represented adolescents' perceived relationship quality with parents and best friend. These profiles could be subdivided in the broader categories of relationships that are concordant (i.e., relationships with parents and best friend of similar quality) and discordant (i.e., relationships with parents and best friend of different quality). From ages 12 to 16 years, there was an increasing proportion of adolescents experiencing a turbulent relationship with their parents and

best friend. From ages 16 to 20 years, the proportion of adolescents that experienced a concordant turbulent relationship with their parents and best friend decreased, whereas the proportion of those in a concordant harmonious relationship with their parents and best friend increased. Meanwhile, the proportion of adolescents that experienced a discordant parent-oriented decreased in early adolescence as well as in late adolescence. This implies a trend of parents becoming less salient during the adolescence years (e.g., Youniss & Smollar, 1985). Although anxious adolescents displayed a higher prevalence of harmonious relationships than non-anxious and anxious adolescents, both groups of adolescents did show similar patterns of relationship development. In conclusion, these findings showed how the development of relationship quality with parents and best friend intertwine, and demonstrated that although high levels of anxiety symptoms related to a higher chance of perceiving relationship difficulties, only about one third of adolescents with high levels of anxiety symptoms perceived relationship difficulties.

Next, in the **fifth chapter** we explored the extent to which individual differences in parent-adolescent relationship quality development continues to the quality of later romantic relationships. To identify types that optimally represented parent-adolescent relationship quality development, we used adolescents', mothers', and fathers' reports on this relationship and as accounted for the multidimensional nature of relationships, using data that was annually gathered across a six-year period (i.e., 13 to 18 years). We examined how these profiles of parent-adolescent relationship quality development affect adolescents' and romantic partners' perceptions on relationship quality. Analyses generated authoritative, indulgent, distant, and authoritarian profiles of parent-adolescent relationship quality development trajectories. Of these profiles, an authoritative relationship with parents predicted the highest romantic relationship quality as perceived by adolescents as well as their romantic partners. In contrast, a distant relationship with parents related to the worst romantic relationship quality as perceived by adolescents as well as their romantic partners. Thereby, parent-adolescent relationships predicted partners' romantic relationship experiences in an indirect way: they predicted the partners' relationship experiences only if the target adolescents' romantic relationship experiences were also considered. Parent-adolescent relationship thus seem to affect future romantic relationship quality, but only in a limited manner. Thereby, our findings show that parent-child relationships have far-reaching, yet subtle effects on later romantic relationships.

Table 1 provides an overview of the main findings per study. The next section of this chapter will integrate and discuss the findings of the different studies.

Table 1
Overview of the Main Findings per Study

Individual differences in parent-adolescent relationship quality	
Chapter 2	• Produced harmonious, average, authoritarian, and detached parent-adolescent relationship quality profiles. • Replicated these types in a subsample and demonstrated the external validity of these relationship profiles • Showed that an adjusted person-centered approach enhanced the predictive power of these profiles
Chapter 3	• Produced harmonious, authoritative, uninvolved-discordant, and turbulent parent-adolescent relationship quality profiles. • Identified typical developments of parent-adolescent relationships: in early to middle adolescence, some adolescents moved away from an authoritative relationship profile with their parents or changing into an uninvolved-discordant or turbulent relationship with their parents. In middle to late adolescence, a majority of adolescents changed the relationship with their parents into a harmonious relationship profile. • Identified atypical developments of parent-adolescent relationships: some early-to-middle adolescents continued to perceive an authoritative relationship and some middle-to-late adolescents continued to perceive the relationship with their parents as uninvolved-discordant or turbulent.
Continuity of parent-adolescent relationship quality to friend and romantic relationship quality	
Chapter 4	• Produced five profiles representing adolescent relationships with parents and best friends that were concordant (i.e., relationships with parents and best friend of similar quality) or discordant (i.e., relationships with parents and best friend of different quality). • Demonstrated that there was an increasing proportion of adolescents experiencing a turbulent relationship with their parents and best friend in early to middle adolescence. In middle-to-late adolescence, the proportion of adolescents that experienced a concordant turbulent relationship with their parents and best friend decreased, whereas the proportion of those in a concordant harmonious relationship with their parents and best friend increased. • Showed that non-anxious and anxious adolescents have similar patterns of relationship development. The latter group, however, displayed a higher prevalence of turbulent relationships and a lower prevalence of harmonious relationships.
Chapter 5	• Produced authoritative, indulgent, distant, and authoritarian parent-adolescent relationship quality profiles • Demonstrated that an authoritative relationship with parents predicted the highest romantic relationship quality; whereas a distant relationship with parents related to the worst romantic relationship quality. • Showed that parent-adolescent relationships predicted partners' romantic relationship experiences only if target young adults' romantic relationship experiences were also considered.

Integration and Discussion of Findings

Individual differences in adolescent personal relationship development
We examined the separation-individuation, evolutionary, maturational, and expectancy violation-realignment theoretical perspectives which suggest that perturbations in family relationships occur (e.g., Collins & Luebker, 1994; Youniss & Smollar, 1985), as well as the developmental theory of interpersonal relationships that proposes friendships to become more close and important (e.g., Sullivan, 1953). We tested these major developmental perspectives by applying a person-centered approach to examine the potential individual differences that can occur. Thereby, we initially produced types of relationship quality profiles and then examined individuals' change from one profile into another. Our findings are partly in line with these perspectives: (i) we identified a trend of perturbations in the relationship with parents that seem only temporary and we found these patterns in the friend domain as well; and (ii) only a few adolescents demonstrated these tumultuous developmental patters. We discuss these findings below in more detail.

Four types of parent-adolescent relationship quality. Across studies, we repeatedly identified comparable parent-adolescent relationship quality profiles using the key components power, support and negative interaction (e.g., Furman & Buhrmester, 1985; Steinberg & Silk, 2002). That is, in most of our studies, we obtained turbulent, harmonious, uninvolved/detached and authoritative adolescent relationship quality profiles with parents. This is interesting in two ways. First, this typology seems to reflect the most common parent-adolescent relationship profiles. The robustness of these profiles is underscored by the fact that we replicated them using various types of statistical analyses (i.e., latent profile analysis, latent transition analysis, and latent class growth analysis), at several ages (i.e., cross-sectional and longitudinal measures), using various combinations of self-reports on relationship quality (i.e., perspectives of adolescents only or perspectives of adolescents and parents), and using several combinations of relational dimensions (i.e., constellated by all three key relational components or by two key relational components).

Second, the parent-adolescent relationship typology seem to be relative comparable to the parenting typology of Baumrind (1991). Baumrind's typology produced permissive, authoritative, uninvolved, and authoritarian parenting styles which were constellated using the parenting dimensions warmth and demandingness. Our parent-adolescent relationship typology thus seems to conceptually replicate Baumrind's parenting typology. One reason why these typologies are so similar might be that parenting eventually forms the quality of parent-adolescent relationship and vice versa. For instance, an authoritative parenting may consequently lead to a relationship quality

profile indicating an authoritative parent-adolescent relationship; while an authoritative relationship with parents further promotes the authority of parents toward their children.

Temporary difficulties in adolescent relationship with parents and friends. Generally, we identified a U-shape pattern of adolescent relationship quality development with parents as well as with friends. Adolescents do experience perturbations, but these perturbations are only temporary and occur in their family as well as their friend relationship domain. Chapter Three demonstrated a reverse U-shape pattern on parent-adolescent relationship development by showing that adolescents tended to change into a hierarchical and unsupportive relationship with parents in the beginning of adolescence, whereas they tended to change into an egalitarian and supportive relationship with parents by the end of adolescence. Chapter Four extended previous findings by revealing that adolescents' relationship quality with parents and friends intertwined and that for some adolescents relationship impairments and improvements did not only manifest in the relationship with parents, but also in the relationship with friends. This chapter shows increasing proportions of both poor quality parent-adolescent relationships and poor quality friendships in early adolescence and increasing proportions of satisfactory parent-adolescent relationships as well as an increasing proportion of satisfactory friendships in late adolescence.

However, we also identified important heterogeneity in these developments. Both Chapter Three and Four indicated that less than half of our adolescent sample experienced a tumultuous relationship with their parents and best friend, whereas more than half of our sample actually experienced improvements instead of difficulties in these relationships. This phenomenon also occurred in adolescents with high levels of anxiety, who tend to be susceptible for personal relationship difficulties. Specifically, one-third of the anxious adolescents experienced tumultuous personal relationships while only one-tenth of the non-anxious adolescents did so. Thus, although anxious adolescents experienced more tumultuous social relationships than non-anxious adolescents, more than half of the anxious adolescents did not perceive a tumultuous personal relationships. In fact, some of these anxious adolescents experienced a supportive relationship quality with their parents and/or best friend. Thus, these findings add to the accumulating evidence of adolescence showing a far less intense personal relationship development than presumed (e.g., Arnett, 1999; Hollenstein & Lougheed, 2013). They also emphasize the importance of studying heterogeneity in relationship development using person-centered approaches, as key nuances in our studies would have been overlooked in variable-centered studies that mainly indicated distress to occur in adolescents' personal relationships.

Multifinality and equifinality developmental pathways. The heterogeneity in adolescent relationship experiences that was found in the current dissertation also sheds light on the *multifinality* and *equifinality* concepts of developmental pathways (e.g., Cicchetti & Rogosch, 2002). Multifinality entails that any starting point evolves in diverse final states. We found support for multifinality in two ways. First, Chapter Three shows that although overall prevalence rates indicated increasing turbulence and a decreasing prevalence of authoritative relationship with parents, there was no evident trend of adolescents changing into one specific relationship quality profile during early adolescence. Early adolescence thus seems to be a period of increased variations in transitions of perceived relationship quality. Second, Chapter Four demonstrated that adolescents differed in the development of their relationship with parents and friends. Some concordant relationships with parents and best friend become discordant, whereas some discordant relationships with parents and friends become concordant. Thereby, some of the harmonious concordant relationships with parents and best friend become tumultuous concordant, or vice versa. Some parent-oriented adolescents in discordant relationships become friend-oriented, or vice versa. Overall, these findings add to the accumulating evidence of substantial heterogeneity in adolescents' relationship developments (e.g., Arnett, 1999; Hollenstein & Lougheed, 2013). Future research should examine why some adolescents start in a similar relationship quality in the beginning of adolescents, yet establish a different relationship quality by the end of adolescence. We speculate that certain relationship experiences may cause such heterogeneity. For example, friend-oriented adolescents who had extremely negative experiences with their best friend (e.g., dumped by their best friend, betrayed by best friend), may be more likely to turn to their parents over time than friend-oriented adolescents who had less negative experiences with their best friend.

Equifinality suggests that different starting points develop into one final state. We also found evidence for equifinality in two ways. First, chapters three and four demonstrated that various types of parent-adolescent relationships generally became more supportive and egalitarian by the end of adolescence. In late adolescence, the proportion of adolescents experiencing a harmonious relationship with parents increased as adolescents from turbulent, authoritative, and average parent-adolescent relationships shifted into a harmonious relationship with parents and friends. This indicates that adolescents typically move to perceive an egalitarian and satisfactory relationship by late adolescence (e.g., Collins & Luebker, 1994; Youniss & Smollar, 1985), somewhat regardless of what their relationship initially was like. Second, chapter Four illustrated that adolescents from various types of concordant and discordant relationship with their parents and best friend tend to become more friend-oriented. The proportion of adolescents experiencing a high-quality relationship with their friends increased as adolescents from turbulent, harmonious, average, and parent-oriented relationship

types with parents and friends changed into a peer-oriented relationship quality type. Thus, the proportion of adolescents experiencing a high-quality relationship with their friends as well as their parents increased. These findings indicate a trend of developing satisfactory relationships with parents as well as with friends for adolescents who started in any type of relationship type. Future research should examine why some adolescents do succeed in establishing satisfactory relationships with their parents and best friend, whereas others do not. Such studies could examine variables, such as personality (e.g., Noftle & Shaver, 2006) or social competence (e.g., Kan & McHale, 2007), as these variables may lead to differences in relationship quality development.

The family relationship as a foundation for other personal relationships

We tested the attachment (Bowlby, 1978) and social-cognitive perspectives (Bandura, 1977) which presumes that the family context lays the foundation of later personal relationships. We did so by examining the extent to which the relationship quality with parents continues to the relationship quality with friends and romantic partners. In contrast to the attachment (Bowlby, 1978) and social-cognitive perspectives (Bandura, 1977), our results show that parent-adolescent relationship quality do not necessarily continue to other personal relationships. We discuss these findings below in more detail.

The subtle impact of parent-adolescent relationships. Our findings illustrate that the influences of the parent-adolescent relationship on the development of other relationships are still relatively limited. Specifically, Chapter Four showed that adolescent relationship with parents and best friend intertwine, but that these relationships are not necessarily of a similar relationship quality. Adolescents with a poor relationship quality with their parents do not necessarily develop a relationship of similar quality with their friends. Some of these adolescents actually turned to their friends and developed a high-quality friendship. Thus, the relationship quality in the parental relational domain does not always spill over to the friendship domain.

Although the quality of the parent-adolescent relationship definitely does not fully determine the quality of subsequent relationships, the subtle effects we found do seem to be pretty far reaching. Specifically, Chapter Five showed that parent-adolescent relationship quality influences reach far until young adulthood and into adolescents' as well as their romantic partners' relationship quality perceptions. An authoritative relationship with parents predicted the highest levels of support, intimacy, and passion, whereas a distant relationship with parents predicted the lowest levels of support, intimacy, and passion in young adults' as well as romantic partners' relationship experiences. However, parent-adolescent relationships only predicted partners' romantic relationship experiences if target adolescents' own relationship perceptions were considered, thereby implying an indirect effect of parent-adolescent relationships to partners' experiences on romantic relationship quality.

Several important instances of heterogeneity in this relationship continuity need attention. For example, Chapter Four illustrated that the relationship quality with parents can, but not necessarily does, spill over to the relationship with friends and vice versa. Half of our adolescent sample that experienced a tumultuous or a supportive relationship with their parents also developed a similar relationship quality with their friend. The other half of our sample, however, tend to compensate the lack of support or connectedness with their parents (or friends) by turning to their friends (or parents). This shows the large heterogeneity in how adolescents' relationship experiences with parents and friends relate to each other. Another example is from Chapter Five which shows that equality in parent-adolescent relationships is passed onto romantic relationships only if the relationship with parents is also supportive (e.g., harmonious or indulgent relationship quality). Those who have supportive relationships with their parents pass on their egalitarian relationship to their romantic relationships. However, others that perceived a lack of support and equality in the relationship with their parents do not necessarily experience inequality in their romantic partners. Thus, the extent to which equality in parent-adolescent relationships is passed onto romantic relationships mainly depends on the support levels in the parent-adolescent relationships. These findings may be reassuring, as they suggest that unsupportive parent-adolescent relationships have a lesser impact on future personal relationships than supportive parent-adolescent relationships do. Also, our results seem to contradict the "bad is stronger than good" principle (e.g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), as we show the greater power of good social relationships over bad ones.

The need for a summary of parent-adolescent relationship influences on other social relationships. In examining the literature on adolescent personal relationships, we came across two points that make it difficult to fully understand the influences of parent-adolescent relationships on other social relationships. First, studies are different in several ways. Specifically, there is heterogeneity in the assessed relationship constructs, as some studies measured relationship quality using constructs related to support (e.g., Gallagher, Prinstein, Simon & Spirito, 2014; Kogan et al., 2013; Kogan, Yu, & Brown, 2016; Meeus, Branje, van der Valk, & de Wied, 2007; Pinquart & Pfeiffer, 2013) while other studies investigated this using measures of constructs related to conflicts (e.g., Aseltine, Gore, & Colten, 1994; Hazel, Oppenheimer, Technow, Young, & Hankin, 2014; Linder & Collins, 2005; Slominski, Sameroff, Rosenblum, & Kasser, 2011; Stocker & Richmond, 2007; Walper & Wendt, 2015) or power (e.g., Allen, Hauser, O'Connor, & Bell, 2002; Hare, Szwedo, Schad, & Allen, 2015; Oudekerk, Allen, Hessel, & Molloy, 205; Scharf & Mayseless, 2008; Smetana & Gettman, 2006) . This is a limitation because some relationship constructs with parents might be less likely to be passed on to friendships and romantic relationships. For instance, there might be a larger effects from parent-child relationship on friendships and romantic relationships

in constructs related to support and conflict, but not in power as these relationships differ in their nature of power equality.

There is also a large heterogeneity in the age group that is assessed and the timespan between measures. Some studies examined this continuity during early adolescence (e.g, Hazel et al., 2014; Helgeson et al., 2014; Letcher, Smart, Sanson, & Toumbourou, 2009; Rodríguez, Perez-Brena, Updegraff, & Umaña-Taylor, 2014), while other studies examined this during late adolescence (e.g., Kretschmer et al., 2016; Luyckx, Missotten, Goossens, Moons, & Investigators, 2012; Pinquart & Pfeiffer, 2013; Rice & Mulkeen, 1995; Song, Bong, Lee, & Kim, 2015). Some studies have also examined this relationship continuity in adulthood (e.g., Giordano, Cernkovich, Groat, Pugh, & Swinford, 1998; Kogan et al., 2013; Meeus et al., 2007, Slominski, 2011; Vezina et al., 2015). Differences between age periods are important to examine as doing so would give us information on the critical period and the durability of parent-child relationship influences on friendships and romantic relationships. For instance, the parent-child relationship context likely is more influential in early adolescence than in adulthood as parental influences decrease as adolescents grow older (e.g., de Goede, 2009a).

Second, many past longitudinal studies did not account for the potential effects of friendships and romantic relationships on the relationship with parents, although there are a few studies that did (Burke, Sticca, & Perren, 2017; De Goede, Branje, van Duin, Van der Valk, & Meeus, 2012; Defoe et al., 2013; Johnson, Galovan, Horne, Min, & Walper, 2017; Luyckx, Missotten, Goossens, Moons, & Detach Investigators, 2012), whereas many others did not. However, adolescents' relationship with parents, friends, and romantic partner can bi-directionally influence each other. For example, The turn-to-friends hypothesis suggests that adolescents who experience tumultuous friendships or romantic relationships could compensate the absence of connectedness by having close family relationships as they turn to family for support (e.g., Helsen et al., 2000). Therefore, in examining the effects of parent-adolescent relationships onto friendships and romantic relationships, it is also important to control for the potential effects of friendships and romantic relationships, as they can also affect adolescent relationship with parents.

Altogether, there is a need for a study that synthesizes the effects of various parent-child relationship constructs on various friendship and romantic relationship constructs in different age groups while controlling for potential effects of friendships and romantic relationships on the relationship with parents. Such a study could provide a more comprehensive understanding of the relationship continuity phenomenon. To address this issue, we started a largescale longitudinal multilevel meta-analysis. This meta-analysis should provide insight into parent-adolescent relationship influences on

friend and romantic relationships for different relationship constructs and age periods and as controlled for the potential effects of friend and romantic relationships on the relationship with parents. Appendix A: Ongoing Procedures of Meta-analysis provides a first draft of the method section of this meta-analysis.

Strenghts and Limitations

The current dissertation is characterized by several strengths. First, our studies took account of the multidimensional nature in examining adolescents' personal relationship quality by producing profiles constellated of the key relational dimensions power, support, and negative interaction. This is crucial, as the interpretation of a relationship quality typically depends on multiple relational dimensions. Second, most of our studies accounted for potential heterogeneity that may occur in adolescent relationship experiences. By doing so, we demonstrated the large individual differences in adolescent relationship experiences and provided nuances in how adolescent relationships develop and influence each other over time. Third, our studies used person-centered approaches for examining adolescent relationship development and the linkages between between adolescent personal relationships in the most appropriate statistical manner. For example, we applied person-centered methods such as latent profile transition analysus and profile trajectories analyses. We also applied mediation models to examine the linkages between parent-adolescent relationship quality profile and later romantic relationship quality. Using these advanced methods, we showed that individuals experience different types of relationship quality, which are related to subsequent outcomes. Thereby, this dissertation provides an overview of how relatively novel statistically solid methods can be used to further advance knowledge on adolescent relationship experiences.

However, the current thesis is also characterized by some limitations. First, most of our studies used a single, self-report measure to examine adolescents' relationship quality development with their parents and/or their best friend. Literature, however, noted that own relationship experiences are crucial in predicting developmental outcomes, such as well-being and self-esteem (e.g., Branje, van Aken, & van Lieshout, 2002). Nevertheless, future research should examine whether parents perceive similar patterns of relationship quality development, or investigate how perception similarities and discrepancies in relationship quality evolve throughout adolescence. Second, although we did demonstrate the effects of GAD symptoms on adolescents' relationship quality development, other potential factors affecting observed changes in relationship quality remained unexamined. For example, it remains unclear why some adolescents succeeded to establish satisfactory relationships by the end of adolescence, whereas others do not. It also remains unknown why the spillover phenomenon manifested itself in some

adolescents, while the compensation phenomenon emerged in others. Future studies should examine constructs, such as personality (e.g., Noftle & Shaver, 2006) and social competence (e.g., Kan & McHale, 2007), that may affect differences in relationship quality development. Third, examining the adolescence period only offers a limited understanding of the timing on relationship quality change and stability patterns that can reach far back into childhood or reach further into adulthood. For instance, those who remained in a harmonious relationship across the adolescent years may already have had a turbulent phase with their parents in childhood. Future studies should try to examine relationship quality development covering both childhood and adulthood using one cohort, even though this is challenging.

Recommendations for Future Research

Other than the aforementioned directions for future studies following previous limitations, several other recommendations need warrant. First, we would recommend to examine relationships using a multidimensional and multi-report person-centered approach design. Given the complexity of relationships, research that aims to understand relationship quality should ideally include different individual perspectives on several relationship dimensions simultaneously. Person-centered approaches are therefore ideal to synthesize multidimensional and multi-informant data on relationships in a parsimonious way.

Second, we would recommend exploring how adolescents' different relationship quality domains intertwine on a daily basis as well as exploring their motivation to show this relationship behavior. This could provide insights on the extent and how, for instance, conflicts in the relationship with parents may affect adolescents to turn towards or move away from their friends and/or romantic partner on the same day, and which cognitions are linked to these relationship behaviors. Novel methods, such as micro level quantitative as well as qualitative experience sampling methods, would help to provide such data (e.g., Lennarz, Lichtwark-Aschoff, Finkenauer, & Granic, 2017).

Third, we would encourage to examine how adolescents' with different relationship quality with parents and/or friends would be affected by certain fundamental transitions across the lifespan, such as moving out of the parental home and transitioning into college. How would moving out of the parental home affect adolescents' relationship with parents as well as their well-being and would these effects differ between those with a harmonious, authoritative, and turbulent relationship quality with their parents? How would the transition to college affect adolescents' relationship quality and stability with their high school friends and would these effects differ between those with satisfactory

and poor quality friendships? Longitudinal person-centered approaches using latent change models could help answering these questions.

Implications for Practice

First and foremost, practitioners should ideally take account of multiple relationship domains when examining adolescent relationship experiences. Our findings emphasize that adolescents' relationship with parents and friends intertwine such that they can be similar or different from each other. Practitioners should take account of the multiple relationships important to adolescents' life and examine how these relationships influence each other.

Second, practitioners should bear in mind that the so-called storm-and-stress may be far less common than assumed, and that this storm-and-stress period would be only temporary for some. Similar to the age-crime curve (e.g., Moffitt, 1993), there seem to be a peak of turbulent relationships with parents and friends in mid-adolescence that decreased thereafter. This indicates that this tumultuous period is only temporary and that it would not necessarily be problematic. Practitioners should pay attention to individuals that do remain and continue to perceive tumultuous relationships by the end of adolescence. Doing so, practitioners could distinguish adolescents that either experience a temporarily or chronically stressful social environment, in which the latter adolescents may be more susceptible to develop problems.

Finally, we find across our studies that adolescents in a turbulent and authoritarian as well as distant and uninvolved family relationship systems are the most susceptible for psychopathology symptoms, a less adjusted personality profile, and other interpersonal problems. Such relationship systems are typically characterized by the lack of responsive and supportive parents. Interventions that focus on parent-child relationship quality should be focused on unsupportive relationship systems as such relationships are highly in risk to be maladaptive. Unsupportive relationships are relatively more common during early adolescence than in late adolescence. Practitioners could intervene if relationships remain poor from the early into the late adolescence years.

Concluding Remarks

This thesis provided important nuances to some major theoretical notions on adolescents relationships development. In fact, we showed that many adolescents' relationship with parents is not as tumultous as presumed and that some adolescents do not necessarily become independent from their parents. Importantly, we demonstrated that the family context does not necessarily impact other social relationships. Some adolescents with a poor relationship with parents can still establish satisfactory relationships with friends or a romantic partner. These findings emphasize the importance of examining heterogeneity, as there are large differences among adolescents' relationship experiences. Obviously not all individuals have similar or normative relationship experiences in life. Person-centered approaches would therefore provide a valuable addition to the current predominantly variable-centered-based literature.

Appendix A: Ongoing Procedures of Meta-analysis

Eligibility criteria

Our literature search aimed to identify research studies that examined longitudinal linkages between parent-adolescent relationship quality and their friend and/or romantic relationship quality. We used three main criteria to select eligible studies. The first criteria is that the study should include adolescent and/or young adult sample (i.e., age range 7 to 25 years). The second criteria is that the study should include adolescent and/or young adult relationship constructs with their parent(s) as well as relationship constructs with their friends and/or romantic partner. The third criteria is that the study should have a longitudinal design. The literature search was limited to articles published in academic journals to maximize the methodological soundness. However, since this could lead to a potentially larger mean effect size in published versus unpublished studies, we also examined for potentially publication bias which will be discussed in detail later. Finally, we set no language limitations and translated studies that were obtained in non-English languages.

Literature search

To search for relevant studies, we used three strategies. The first strategy is that we searched for English-language journal articles in database ERIC, PsycArticles, PsycInfo, SCOPUS, and Web of Science for all years covered through 12th October 2017. We used a combination of the following search terms. We used terms referring to adolescent and/or young adult sample (adolescen*, teen*, youth, youngst*, student*, "emerging adult*", "early adult*", "young adult*"). Additionally, we used terms referring to relationship constructs (relation*, dating, warmth, bond, affecti*, attachment, intimacy, nurturance, sensitivity, support, aggression, conflict, discord, hostility, discipline, abuse, victimization, violence) with parents (famil*, parent*, mother*, father*, maternal, paternal) as well as friends and romantic partners (friend*, peer*, romantic*, intimate*, marital, marriage, couple*). Finally, we used terms referring to the study design (longitudinal*, prospective, intergenerational, transmission, spillover, "spill*_over")[9]. The second strategy entailed that we searched the websites of the top ten journals deemed most likely to publish studies on adolescent interpersonal relationships. Specifically, we manually searched for articles in the most recent issues and online first and/or early view sections of the top ten journals identified by Web of Science and SCOPUS as having the most records concerning our search terms.

9 The asterisk allowed for the inclusion of alternate word endings of the search term. For example, adolescen* yielded articles containing adolescent, adolescents, and adolescence. The quotes allowed for the inclusion of two words combined. For example, "early adult" yielded articles containing young adults and not only articles that addresses the concepts of young or adults. Appendix A provides the exact search strings in each of the databases.

The list of these journals is illustrated in Appendix B. The third strategy entailed that we searched for articles by examining the reference sections of relevant review articles (i.e., Meeus, 2016) and of all articles included in current meta-analysis.

Figure 1 displays the results of our literature search following the PRISMA guidelines (e.g., Moher, Liberati, Tetzlaff, & Altman, 2009). Specifically, our search strategy resulted in 6,375 potentially relevant journal articles. From this set, we removed 1,731 duplicates. We then screened the remaining 4,669 articles with a two-step approach. In the first step, Susanne Schulz (SS) and Hana Hadiwijaya (HH) screened the titles and abstracts of these articles. The interrater reliability on 25% of study selection of this first step was good (K = .91). In the second step, mainly HH assessed all articles in full-text to examine whether they met the eligibility criteria, but 25% of the studies was rated by SS and HH to obtain estimates of interrater reliability. The interrater reliability on study selection of the second step was good (K = .89). All diverging assessments were discussed until consensus was reached. This two-step procedure left 177 journal articles for analyses.

Coding of study characteristics and effect sizes

The authors SS and HH assessed 20% of the studies to obtain estimates of coder reliability. The interrater reliability for the main effect sizes was perfect (K = 1.0). After obtaining agreement, SS and HH each coded half of the total studies.

Study characteristics. We coded numerous data. First, we coded data regarding the journal ranking and impact factor based on the study year of publication. In a few studies, however, the ranking and impact factor was unknown for the specific year of publication. In such cases, we took the ranking and impact factor of the year closest to the year of study publication. Second, we coded data regarding the study procedures such as country of study, recruitment location and recruitment strategy. Third, we coded data regarding the waves such as the number of waves concerning the parent-adolescent relationship measure and friend and/or romantic relationship measure, lag between measures, and mean retention rate across waves. Fourth, we coded data regarding the participants at the first measurement wave of the parent-adolescent relationship measure. We coded the total sample size, mean age of participants, type of participants, proportion of males, proportion of ethnic minorities, proportion of participants living with both or single parents. If the mean age of participants was not reported, we used the grades of participants to estimate the age. For example, if a study that examined a sample of sixth grade adolescents did not report the mean age, we estimated it to be 12 years (as done by e.g., Sowislo & Orth, 2013). Fifth, we coded data regarding the friend and/or romantic relationship such as the type of romantic sexuality, type of friend and the stability of friend and/or romantic partner across waves.

Lastly, we coded data regarding the relationship constructs such as type of relationship constructs, the type of informant, and the quality of the measure.

Effects of parent-adolescent relationship. We used Pearson's correlations of continuous relationship scores with at least one time lag between assessments to operationalize the longitudinal effects of parent-adolescent relationships on friend and romantic relationships. For example, when parent-adolescent relationship support was measured at wave one and friend support was measured at wave two, we entered $r_{\text{parent1}}r_{\text{friend2.}}$ There were many studies in which adolescents were assessed at more than two waves. In such cases, we entered all correlation coefficients for all possible combinations. For example, when parent-adolescent relationship support and friend support was measured at three waves, we entered $r_{\text{parent1}}r_{\text{friend2,}}$ $r_{\text{parent1}}r_{\text{friend3}}$, and $r_{\text{parent2}}r_{\text{friend3.}}$ Studies with multiple waves also allowed us to control statistically for the dependency of friend and romantic relationship quality of the previous wave onto parent-adolescent relationship quality in the next wave; as well as to control the stability of adolescent relationship quality with parents, friend, and/or romantic partner across waves. Some studies included categorical data. We computed the biserial correlations, polychoric correlations, or the odds ratios of from these studies.

More than half of the studies (59%) did not directly report effect sizes in the article (i.e., Pearson's correlations, biserial correlations, polychoric correlations, or the odss ratios). We contacted authors of these studies to provide us the effect sizes. We contacted either the first or the corresponding author as well as the last or the second author of the study depending on the contact information that we obtained. A reminder email was sent after two weeks[10].

10 Some authors responded that they needed more time to provide us the data and thus these authors received additional time to provide the data.

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Summary in English

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This dissertation presents heterogeneity or individual differences in adolescent relationship quality development with their parents and how these differences shapes their friend and romantic relationships. The reason for doing this is because most adolescent relationship studies failed to capture the potential individual differences that occur in various relationship types while the existence of such differences seems obvious. Obviously not all individuals have similar or normative relationship experiences in life.

The second chapter of this dissertation presents heterogeneity in the *current* adolescent relationship quality with their parents. We identified four clearly distinct types of relationships: harmonious, average, authoritarian and detached types of parent-adolescent relationship quality. Most of our adolescent sample displayed a harmonious or an average relationship quality with their parents and only a minority of our sample displayed a turbulent or detached relationship quality with their parents. These four relationship profiles were also differentially linked to psychopathology and personality. Adolescents with a harmonious relationship with their parents have the least psychopathology symptoms and the best-adjusted personality profile, while those with a turbulent relationship have the most psychopathology symptoms and least-adjusted personality profile.

The third chapter of this dissertation demonstrates trends as well as heterogeneity in the *development* of adolescent relationship quality with their parents. In early-to-middle adolescence, we identified a trend of fewer adolescents that perceived an authoritative relationship with their parents and more adolescents that perceived a turbulent relationship with their parents. It seemed that adolescents moved toward perceiving a poorer relationship, as they seemed to question the authority enforced by their parents. However, a substantial proportion of adolescents remained to perceive an authoritative relationship and changed or remained into a harmonious relationship with their parents. This suggests that some adolescent remained to perceive a relationship in which they received parental support and endorsed parental authority and that many adolescents experienced improvements instead of difficulties in the relationship with their parents. In middle-to-late adolescence, there was a trend of increasing prevalence of adolescents who perceived a harmonious relationship with parents. Adolescents who perceived a turbulent or authoritative relationship with parents became less common. Not all adolescents, however, established a satisfactory relationship quality with their parents: more than one-third of the adolescents continued to perceive an uninvolved-discordant or in a turbulent relationship by the end of adolescence.

The fourth chapter describes the extent to which the relationship quality with

parents spills over into, or compensates for, the relationship quality with best friend in normative and anxious adolescents. In early-to-middle adolescence, there was an increasing proportion of adolescents experiencing a turbulent relationship with their parents as well as their best friend. In middle-to-late adolescence, the proportion of adolescents that experienced a turbulent relationship with their parents as well as their best friend decreased, whereas the proportion of those in a harmonious relationship with their parents as well as their best friend increased. At the same time, fewer adolescents reported only having a good relationship quality with their parents in early adolescence as well as in late adolescence. Some adolescents who initially had a close relationship only with their parents, tended to form close friendships as well. This implies a trend of parents becoming less salient and friends becoming more salient as adolescents grow older. Anxious adolescents showed a higher prevalence of turbulent relationships and a lower prevalence of harmonious relationships than non-anxious adolescents. Still, more than the half of anxious adolescents did not perceive a tumultuous relationship with their parents and best friend.

Finally, **the fifth chapter** presents the extent to which distinct types of parent-adolescent relationship quality development shapes the quality of later romantic relationships. An authoritative relationship with parents predicted more support and intimacy in the romantic relationship as well as more commitment to the relationship as perceived by adolescents and their partners. A distant relationship with parents related to less support, intimacy, and passion in the romantic relationship as perceived by adolescents as well as their romantic partners. Parent-adolescent relationships predicted partners' experiences only if the target adolescents' romantic relationship experiences were also considered. This indirect effect from parent-adolescent relationships on the romantic partner's relationship perceptions underscores the limited influences of parent-adolescent relationship quality on romantic partner relationship experiences

Altogether, by examining potential heterogeneity in relationship quality our findings offer support for adolescents showing less perturbations throughout their personal relationship development than was previously assumed. Also, adolescents' relationship with parents does not necessarily shape friend and romantic relationships. Our promising findings mark the need for studying individual differences in relationship development across adolescence.

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About the author

About the author

Hana Hadiwijaya was born on January 1st, 1989 in Surabaya, Indonesia. Eight years later, in 1997, Hana moved to The Netherlands.

After finishing secondary school at Melanchthon College in Rotterdam in 2007, she started her professional education in Social Work and Services at the Haagse Hogeschool in Den Hague. However, in 2008 she changed studies and started a Bachelor in Psychology at the Erasmus University in Rotterdam. After graduating in 2011, Hana continued her education with the Research Master Clinical and Developmental Psychopathology at the Vrije University in Amsterdam. During her studies, she often worked as research-assistant for different research groups, such as the RISBO institute at Erasmus University in Rotterdam and the Clinical Psychology department at the Vrije University Amsterdam. In 2012, she and two of her classmates founded the William James Study Association at the Vrije University Amsterdam. After graduating cum laude in 2013, Hana worked as a researcher at the Clinical Child and Family Studies department at Vrije University Amsterdam. From 2014 until 2018, she was a PhD-candidate at the Developmental Psychology department at Tilburg University. During these four years, she travelled many times to participate in several international conferences. In 2017, she visited Oberlin College in Ohio, United States from March until June. In that year, she also visited Bologna University in Cesena, Italy from mid until end October. Currently, in 2018, Hana started a traineeship in Data Science and Business Analytics. As part of this traineeship, she started a post-master education in Data Science and Business Analytics at the Vrije University in Amsterdam and temporarily works as a data scientist at the local government in Vlaardingen. She lives in Rotterdam, The Netherlands, together with her partner Terry and cat Dino.